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ABSTRACT

Four issues of the "Macintosh Lab Monitor" document the Computer-Aided Writing Project at the Forman School (Connecticut) which is a college preparatory school for bright dyslexic adolescents. The project uses Macintosh computers to teach outlining, writing, organizational and thinking skills. Sample articles have the following titles: "The Macintosh Computer and Dyslexia"; "Outline Processing with Acta"; "The Forman Macintosh Lab"; "Teaching Composition on the Macintosh"; "Glossary of Computer Terms"; "Interactivity in the Macintosh Lab"; "Conversational Writing"; "Spelling Checkers"; "HFS: A Visual Filing System for the Macintosh"; "Software Piracy in Secondary Schools"; "A Different Type of Computer Camp"; "Post-Testing Results and Year-End Conversations"; "Thinking and Writing"; "Computer Aided Composition: Looking Backward"; "The Forman Font"; and "Computer Aided Drawing." (DB)

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The Macintosh Lab Monitor

Numbers 1-4

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The Macintosh Lab Monitor

A quarterly publication documenting the Computer-aided Writing Project at The Forman School

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#1
Fall, 1986

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Welcome to the Forman Macintosh Lab and The Computer-aided Writing Project

Richard Wanderman

With this newsletter we would like to share the development and maturation of the new Computer-aided Writing Project at The Forman School. We are using Macintosh computers to teach outlining, writing, organizational and thinking skills to dyslexic high school students. We are designing our curriculum around the particular capabilities of the Macintosh and the particular needs of our students. So far we are more than pleased with what we see happening to our students' writing, and in this issue of *The Monitor* we will attempt to explain why we think we're on to something good.

Because we are on new territory here, we would like to share our problems, our successes and our learning with you. In turn, we would like your feedback on what we are doing. We would also like to hear more about what you are doing in this or related areas.

Card

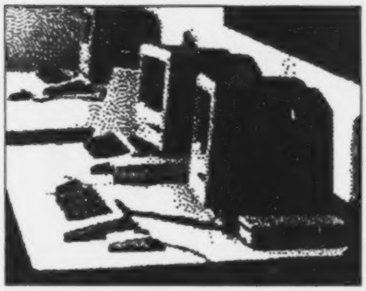
This quarterly newsletter will come to you free of charge. We ask only that you send back the enclosed postcard if you would like to continue to receive it. If we do not receive the card before our next publication date (late February) we will not continue to send you this newsletter.

The Forman School

The Forman School is a private, college-preparatory school for bright, dyslexic adolescents. Forman has a standard high school curriculum for college-bound students and a specialized Language Training (LT) Program in which approximately 82% of the students are currently enrolled. Elsewhere in this issue is a more detailed description of the LT Program, but it is important to realize that the Computer-aided Writing Project is a joint venture between the LT Department and the Computer Department at Forman. That a project of this type could exist at all is a testament to Forman as a special place with a commitment to helping dyslexic students.

History of the Computer-aided Writing Project

After leading two successful Macintosh workshops at Forman during the last two years, I was asked by Dr. Laurel Fais (Head of the Language Training Department) and Richard Peirce (Headmaster) to set up a computer-aided writing laboratory here. The impetus for this was the extremely positive response we had to these workshops and the success of my previous computer-aided writing workshops and seminars elsewhere. Forman, being an innovative school, is the ideal place for an experimental computer laboratory. Now that the Project is under way, we could not be more pleased with the support the school has given us and the enthusiastic response of students and faculty alike.



What Makes Our Approach Different

- We are using personal computers to give dyslexic students the power to write.
- We are teaching students how to use off-the-shelf computers with off-the-shelf software to get real work done.
- We are teaching students to be self-sufficient computer users.

What's so special about this? There are few other schools--public or private, concerned with dyslexia or not--that are using computers in this way. Most schools use computers as electronic drill and practice machines. We believe that students who have a hard time with writing need to *write more*, not simply memorize spelling rules and learn to diagram sentences. Writing is a learning-by-doing process, and the problem with dyslexic writers is that they do not do enough of it to learn by their own experience. Our program (we hope) is going to change that by giving our students more experience with writing of all types, from simple lists and outlines to extensive research papers.

A New Writing Process

What makes writing with a computer different? Simply, writing with a computer radically changes the writing process in that it separates composing from printing. No longer does a mistake mean a re-write. No longer does a paragraph out of place mean a re-write. No more white out. No more illegible handwriting. No more worry about the most mundane part of the writing process. Now our students can worry about more important things, like what they are trying to say. The computer is a prosthetic writing tool for the dyslexic in that it helps compensate for almost all of his weaknesses. We believe that we can make better writers out of our students by showing them how to use computers, which in turn will give them the power to write a lot and to learn about writing from their own experience.

Long-term Effects of Computer-aided Writing

In our culture, reading and writing are important parts of the learning process. People who do not actively participate in these activities are not only disabled learners, they are missing an important channel of information exchange. In the case of dyslexic people, the use of a computer as a prosthetic writing tool allows them to participate fully in the world of written, verbal communication. The effect this has on their image of themselves as learners and idea producers is profound. With the aid of a computer, many dyslexic people can now see their ideas, outside of their heads, in written form for the first time.

A Learning Environment

As important as the type of computer a dyslexic person chooses to use is the spirit in which it is used. Any computer, including the Macintosh, used in an environment of pressure and lack of personal interaction and caring will just amplify the pre-computer problems the dyslexic person had.

The Macintosh is a powerful computer, yet it is fun and easy to use. It seems to violate the spirit of the machine to use it in a way that inhibits work and causes people to worry. Better to use it in an atmosphere of investigation and learn by trial and error. As any experienced Macintosh user will tell you, the best way to learn a piece of software is to put the disk in the machine and mess around. At Forman, we do not believe in prerequisites to computer use. We want to make computers as accessible as possible for everybody. Whether or not a person has typing skills or knows anything about programming is immaterial to his being able to sit down at a computer and get some writing or other work done.

The Macintosh Computer and Dyslexia

Richard Wanderman

Using personal computers is still relatively complex, and using most of them involves precise use of either the English language or a syntactical form determined by the manufacturer. There is a movement in the computer industry, however, toward more visual as well as other, non-verbal computer interfaces, making the use of computers less dependent on written language. The Macintosh computer is an example of such an effort.

Why Macintosh? Visual vs. Command-line Interface

The Macintosh computer is different from most other microcomputers in that it uses a visual as opposed to a command-line interface. The Apple II, IBM PC, and virtually all other microcomputers use a command-line interface. With a command-line interface one types a command or series of commands to make the computer do things. This raises problems for many people using these types of computers; the same problems are exaggerated in the case of the dyslexic person. A few of the problems:

- One has to know the commands in order to type them. This involves memorization.
- One has to spell the commands correctly for the computer to execute them. This also involves memorization. Many of the commands are contractions which are not always phonetic in nature and therefore hard to memorize.
- The syntax of the command structure in many operating systems is not intuitive.

Standardization

Another aspect of virtually all personal computers except the Macintosh is that there is no standardization in the way programs work within the various operating environments. This means that to use three or four programs within any of the non-Macintosh operating environments, one has to memorize different commands for each program. For the dyslexic person with poor memory skills, this type of memorization is hard if not impossible.

Apple made some important decisions about the way they want people to interact with the Macintosh. One of the most important was that the Macintosh operating environment should be (and is) standardized: all programs, whether written by Apple or third party software houses, look and operate in similar ways. Much of the Macintosh interface is built into the computer's ROM and as such is a semi-permanent part of the machine. All software runs within and interacts with this standard visual environment. Unlike other microcomputer software, almost all Macintosh software shares a common operating syntax and a common visual style. The Macintosh operating system shell (the Finder), as another program that interacts with and uses the ROM interface, also looks and feels like every other program that runs on the machine.

Needless to say, this standardization makes using the Macintosh easier than virtually any other computer on the market. In the case of dyslexic people, this ease of use ("user-friendly" in computer jargon) is critical to using a computer at all.

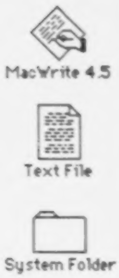
The Visual Interface

The Macintosh visual interface is a different way of making a computer do things. The interface consists of: iconic representations of programs, their files, and utility functions; standardized pull-down menus for operating on files; windows in which to view the contents of disks and folders; the mouse, a pointing tool for moving around on the screen and making selections. The Macintosh's visual interface is made possible by a high-resolution, bit-mapped, black and white screen.

Mouse

The mouse is a pointing tool that replaces the cursor keys on other computers. The mouse makes the use of icons, windows, and pull-down menus possible because it makes moving around the screen easier and faster than cursor keys or joysticks.

Icons



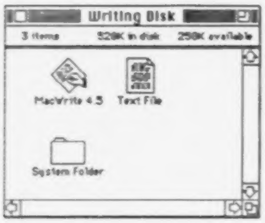
Icons are graphic symbols that visually represent objects on the Macintosh screen. To make a selection within the Macintosh environment, one points to an icon with the mouse and clicks the mouse button. The MacWrite program icon is a picture of a hand writing on a piece of paper with the word "MacWrite" written under it. The MacPaint program icon is a hand brushing on a piece of paper with the word "MacPaint" written under it. One never has to write out the word MacWrite or even recognize the word to select and run the program; one simply points to its icon and clicks the mouse button. Correct spelling is not an issue within this environment; the keyboard is not normally used in making selections.

All programs that run on the Macintosh (also referred to as "applications") have their own, distinctive icons. The files created by different applications also have their own icons and these in some way relate to the application's icon. Most icons visually represent the function of the program they belong to.

Pull-down Menus

All Macintosh software uses pull-down menus located in a line on the top of the screen and available at all times. Menus are activated by pointing with the mouse to the menu of choice, then holding the mouse button down to "pull" the menu down revealing specific menu choices. The visual feedback and kinesthesia involved in making a menu selection with the mouse makes learning how to manipulate menus fast; it usually takes about three minutes for people to learn how to use Macintosh menus. Once learned, menu use never has to be re-learned, since all programs use the same menu system. Most menu selections are only one or two words long. This makes reading them easier for the dyslexic person.

Windows



A window is a visual/spatial area on the screen showing the contents of something. For example, to see the contents of a particular disk, one opens the disk's window revealing icons representing the disk's contents. One can have many windows opened at one time so that one can compare the contents of different disks. Manipulating windows is visual and kinesthetic. They can be moved around the screen by the mouse, or re-sized by dragging one of their corners. Windows appear throughout the Macintosh environment and their functions are standardized. The visual/spatial aspect of windows works well for the dyslexic person who might not be able to remember the contents of command-line directories to compare them to one another.

Multi-sensory Learning System

The kinesthetic feedback that comes from moving the mouse, coupled with the visual feedback of seeing icons, windows and pull-down menus, makes for a powerful multi-sensory learning system. This system makes learning to use the Macintosh faster and easier than other computers. For the dyslexic person, this system makes complex, autonomous interaction with the Macintosh a possibility.

The Screen

The Macintosh's high-resolution black and white screen not only makes its iconic/visual interface possible, it makes reading text easier. For the dyslexic person who has a hard time with reading under ideal conditions, a low resolution computer screen makes reading difficult and sometimes painful. There is enough negative feedback in the reading process for the dyslexic person without adding more with a poor screen. The Macintosh screen, being easy to read, causes less eyestrain than most other screens and contributes little or no negative feedback to the reading process.

Computer-aided Writing with MacWrite

MacWrite is a Macintosh writing program distributed by Apple. It is not the only writing program that runs on the Macintosh, but it is by far the best designed and easiest to use. MacWrite is an extension of the Macintosh working environment. It embodies all aspects of the visual interface that make using the Macintosh easy and appropriate for dyslexics.

All Computer-aided writing functions discussed above in **What Makes Computer-aided Writing Different?** are embodied in MacWrite in a user-friendly way. Even though one can use MacWrite literally immediately to get real writing chores done, MacWrite has enough power to satisfy almost all of a typical person's writing needs. MacWrite allows for complex formatting, headers and footers, searching and replacing, and a number of other features. Most importantly, MacWrite is a *what-you-see-is-what-you-get* word processor. This means that what you see on the screen in terms of formatting is exactly what the printer will print. This is essential for the dyslexic person who needs concrete references with little abstraction.

Outline Processing with Acta

Timothy Shaw

- ▷ Acta
    - ▷ an outline processor
        - ▶ uses Aunt, Sister, Daughter
    - ▷ Editing in Acta
        - ▶ using the MacWrite Edit menu
        - ▶ using the Acta menu
    - ▷ Special features
        - ▶ collapse/expand subheadings
        - ▶ command keys
        - ▶ Acta is a desk accessory

> "Nature has no outline, but imagination has."
> -*William Blake*

Acta is an outlining tool that makes the organization and presentation of ideas easier. Acta helps students understand linear outlines by referring to headings and sub-headings as either Aunts, Sisters, or Daughters. The relationship is easy to grasp: if you want a new heading/topic, choose an Aunt; a sub-heading is produced by asking for a Daughter; if you want a heading on the same level as the one on which you have been working, ask for a Sister. These terms make sense: just as an individual can have an indefinite number of Aunts and Sisters and Daughters, an outline can have endless headings and sub-headings and sub-sub-headings.

Editing an Acta Outline

Acta uses the MacWrite Edit Menu. Users can Cut and Paste text just as they do with MacWrite. Also, an entire sub-heading can be moved to a new location simply by grabbing it with the mouse and re-positioning it. An existing heading can be turned into a sub-heading (Daughter) or a new topic (Aunt) by choosing Move Right or Move Left from the Acta Menu, or by grabbing and re-positioning with the mouse.

Special Features

One of the helpful things about Acta is that sub-headings can be stored away or revealed by clicking on their headings with the mouse. This allows the user to see the outline in full or partial detail. Acta also uses command keys for almost everything. Almost any choice, function, or feature you would want to use in the Acta menu may be chosen by holding down a key called the *command key* and typing a letter (usually one with a mnemonic: A for Aunt, S for Sister, etc.). A student experienced with the keyboard will eventually use the command key to make choices and rarely have to reach for the mouse.

One of the most useful aspects of Acta is that it is a *desk accessory*. A desk accessory is a mini-program that can be used on top of a currently running program. You can run Acta and use it on top of MacWrite, shifting from one to the other with a click of the mouse. This allows you to work in MacWrite with your outline easily available. Moreover, the windows displaying MacWrite and Acta can be easily re-sized so that both are on the screen at once. When the Acta window is re-sized, Acta automatically re-formats the outline to fit the new window size.

Hardware and Software

Richard Wanderman

The appropriateness of the Macintosh computer for this Project has been discussed above. After we decided on the type of computer, the configuration of the machines in the lab and the software had to be decided upon.

What are you planning to do with it?

When an individual approaches a typical computer salesman and asks what type of computer and software to buy, a typical response might be: "what are you planning to do with it?" In designing our lab we asked the same question. The major areas our lab is concerned with are writing, outlining and high-quality printing (for legibility).

The computer world changes rapidly and the family of Macintosh computers is no exception. As we were designing our lab, Apple announced a number of major changes in the Macintosh line, including price reductions across the board. Because of my work with the Macintosh at the University of Oregon, my association with the Eugene Macintosh Users Group and my contacts with Apple and many people who develop software for the Macintosh, I have kept abreast of the new developments as they happened (and are happening) and I was able to work them into our new lab at Forman.

Types of Macintosh Computers

There are now four types of Macintosh computers around: the original 128K, the original 512K, the new 512K *enhanced* and the Macintosh Plus. Apple does not make the 128K Macintosh anymore and my advice to anyone who still has one is to save your money and upgrade to at least 512K of memory. Simply, the 128K Macintosh is a handicapped machine incapable of running most of the excellent software written for the Macintosh and incapable of holding more than nine or ten written pages of text in one file produced with MacWrite 4.5 (and even less with MacWrite 2.2).

There are important differences between each of these machines as far as anyone buying a computer is concerned, and there are differences that are especially important to the dyslexic writer. The reasons behind our decisions to buy specific hardware and software are discussed below.

The Forman Macintosh Lab

Richard Wanderman

Hardware

8 512K *enhanced* Macintosh computers
8 800K external disk drives
3 ImageWriter II printers with AppleTalk cards installed
1 LaserWriter printer
11 AppleTalk connectors

Software

MacWrite (version 4.5, disk-based), a word processor
Acta (version 1.1), an outline processor

System Software

All of the system software we use is the latest available. As of this writing we are using the following:

Finder 5.3
System 3.2
LaserWriter 3.1
Laser Prep 3.1
ImageWriter 2.3
AppleTalk ImageWriter 2.3

Reasoning

Why not use 128K machines?

- 128K is not enough memory to write more than a ten-page document with MacWrite.
- A 128K Macintosh will not run much of the latest (and best) software written for the Macintosh.
- Apple does not make or support the 128K Macintosh anymore.

Why a 512K enhanced instead of a regular 512K?

- The new enhanced Macintosh contains new ROM chips that have fixed problems in the older ROM chips.
- The new ROM chips hold twice as much information as the old ROM chips. This means that some of the operating system that resided on disk before is now part of the hardware (firmware) of the machine.
- The new ROMs contain HFS, a Hierarchical File System which makes using folders to organize files much easier and more effective.

Why a 512K enhanced instead of a Macintosh Plus?

- In our lab we do not need the SCSI port on the Macintosh Plus.
- We do not need the extra 512K of memory for the writing projects we do. 512K is more than enough room for the longest document anyone might want to produce in our lab.

Why double-sided disk drives?

- They are faster than single-sided drives (they read both sides of a disk at the same time). This is important for running spelling checkers and other disk-based applications.
- They hold twice as much as a single-sided drive (800K vs. 400K). This eliminates the problem common to single-sided disks: not enough room for a moderately large system file and a few applications. With 800K disks there is enough room for a large system file and two or three applications like MacWrite, MacPaint and MacDraw, with room left over.

Why external disk drives?

- With a large operating system, MacWrite, and an outline processor all on one disk, there is not a lot of room for files.
- Spelling checkers with large dictionaries need to run from a separate disk drive when checking a document.
- Having an external, 800K disk drive means that one will rarely run out of room when trying to store documents on disk. With single-sided drives, running out of room is a frequent occurrence.

Why network the lab?

- A network means that we do not need a printer for each computer. All of the computers can share all of the printers.
- A network is essential to get the most use out of an expensive peripheral like a LaserWriter printer. A network connection is the only way a Macintosh can connect with a LaserWriter printer.
- In the future we may want to set up a file server in our lab so that each of the eight networked Macintoshes can share various pieces of software running on a hard disk.

Why use an expensive LaserWriter printer in a high school lab?

- The output of a laser printer is more legible than a dot matrix printer and our students have a hard time reading.
- It means a lot to our students to see their writing printed with the precision of the LaserWriter. They need to feel that their writing is worthwhile. When their writing looks good, they get that feeling.
- We use the printer for many school projects that were previously sent to a typesetter. This is saving us money.
- Because the lab is networked, the cost of the printer is spread over many machines. It is a shared device.

Why eight Macintoshes instead of more or less?

- Forman had already bought five Macintoshes, and we had a first year budget (after building the room for the lab and buying furniture) for three more.
- We want to expose as many students as possible to the Macintosh so that, if they feel it is useful, they can have the opportunity to do much of their writing homework on the machines in the lab.
- We do not want such a large lab that we cannot have personal contact with each of our students in a particular class, especially in a composition class. Eight in class is on a par with the rest of Forman's curriculum.
- We need enough computers to make the network and LaserWriter cost effective.

How the Macintosh Lab is Being Used

Richard Wanderman

The Macintosh lab is being used for a variety of classes as well as Language Training. It is also being used for various desktop publishing efforts such as this newsletter.

Classes

Introduction to the Macintosh Computer. Two sections taught by Richard Wanderman and Emmy Pellico.
Composition on the Macintosh. Two sections taught by Timothy Shaw.
Language Training on the Macintosh. 60 students working on writing and thinking skills one-on-one with either Richard Wanderman or Emmy Pellico.

Open Lab Times

Monday..........3:00 - 4:00 p.m., faculty open lab.
Tuesday..........7:15 - 9:15 p.m., student open lab.
Wednesday....2:00 - 4:00 p.m., students and faculty.
7:15 - 9:15 p.m., student open lab.
Thursday.......7:15 - 9:15 p.m., student open lab.
Friday............2:30 - 3:30 p.m., advanced faculty tutorial.

Teaching Composition on the Macintosh

Timothy Shaw

"The more a man writes,
the more he *can* write."
-William Hazlitt

Teaching Composition at the secondary school level is agony.

I cringe thinking of the problems I encounter. Among the most common are: students' fears stemming from past failures, current adolescent anxieties about producing a flawed product, patterns formed by well-meaning but ineffective teachers in earlier classes, the inability to collect and organize thoughts, and laziness.

Of course, this completely ignores the ever-present mechanical errors: poor spelling, poor understanding of rules of grammar and punctuation, poor paragraph formation, lack of logical progression of thought, poor penmanship resulting in "chicken-scratchings," etc.

I should explain that I am a pedagogue who dislikes many of the "teacher's short-cuts" (which too easily become "student's excuses") offered by less-demanding instructors who have tried to minimize student anxiety by treating not the disease, but the symptoms. Among my private dislikes:

Roadblocks to Writing

-"Write the way you talk." This notion, intended to overcome anxiety concerning what sounds "proper," should be used sparingly as a spur to the rough draft. Instead, it somehow develops into the thinking *behind* the final draft: students think they no longer need to polish their writing and make it sound formal. The result: slang, jargon, dialect, vulgarity, and contractions in what should be formal English composition.

-"Hey; English is a *living language*; it's *supposed* to change!" We have this philosophy to thank for such unnecessary indigestibles as "ain't," "a-whole-nother thing," the "hopefully" controversy, and others. This philosophy has also ruined perfectly good words such as "gay"; it has done irrevocable damage to respect for proper spelling.

-The intransigent use of a rigid writing format. Try telling an intelligent mind with a truly workable idea that he must force it into an arbitrary number of sub-headings "for his own good." Not only is such standardization foreign to the adolescent way of thinking, it is abhorrent to any person with any decent writing ability. It is no wonder that students rebel against classroom authority: we often foist nonsense on them as a benefit, with the (maddening to anyone) assurance that "it will help you later on."

The Problem with Composition Teachers

Of course, the most maddening part of the problem is that teachers themselves are the cause. We are unwilling to spend the time needed for a class to learn to write well, so we design shortcuts to take the onus away from teaching writing and put it on the students. We avoid dealing with what we defensively call the "mindless minutiæ of mechanics," because we lack the patience required to teach writing properly and thoroughly.

Needed...

Each of the above-mentioned problems, however, can be overcome with the proper tool. Needed is a tool that makes editing easy, that helps with spelling and punctuation, that allows you to put thoughts down into visible form and then easily juggle them in different ways to produce an outline. Students need something that helps them to overcome the onerous task of writing itself, especially if they are dysgraphic. They need a tool that points out misspelled words, that prints neatly and legibly. They need to be able to change what they have written without the hassle of re-writing their whole paper.

...a Solution

I teach two Composition classes this year at The Forman School. My students are all language disabled--some of them very much so. Their writing suffers, not only from their various disabilities, but also from being exposed to the shortcuts expressed above. Fortunately, we have found the proper tool. My classes use Macintoshes. With a Macintosh, students receive immediate positive reinforcement by seeing their prose appear neatly in front of them; re-organizing ideas on the page is easy, and writing and editing are a piece of cake.

Even better is software that specifically aids writing, such as spelling checkers and outlining programs. A spelling checker that sends the student to the dictionary only for the words unfamiliar to its vocabulary takes much of the drudgery out of having to check his own spelling. An outlining program that can help the student organize his thoughts and keep his outline handy while he works in a word processing program is a dream come true.

My classes have just begun to discover the ways in which the Macintosh helps their writing. I will be sharing our discoveries in upcoming issues.

Language Training on the Macintosh

Laurie Fais, Ph.D.

With the advent of the Macintosh Laboratory at the Forman School, the Language Training Department has been able to add a very important component to its curriculum: Computer-aided writing.

Language Training

The Language Training (LT) Department is composed of 31 teachers who work, in a one-to-one situation, with 182 students (about 82% of the school population). Five areas of instruction comprise the LT curriculum: basic skills (encoding, decoding, and penmanship), reading comprehension, vocabulary, study skills and writing. The LT Department is committed to providing each student with the language skills and learning strategies in each of these areas that he/she needs to function as an independent learner.

Skills

Those skills and strategies are really of two different kinds: remediation and coping skills. Computer-aided writing is a blend of the two: writing with a computer, students are better able to express their ideas in written form, i.e., to remediate their writing problems, because they are no longer fighting the problems of dysgraphia or poor organizational skills--the use of a computer compensates for these problems.

LT Computer-aided Writing Screen

In order to determine which students would be involved in the program, teachers in the LT Department completed a screening questionnaire for each of their students; approximately 50 students were selected on the basis of the information received. Higher priority went to students who are dysgraphic or who have writing organizational problems, seniors, and students highly recommended by their teachers for reasons of self-esteem, enthusiasm, prior experience, etc.

The Curriculum

The students meet with Emmy Pellico or Richard Wanderman, the directors of the lab during their LT class time. After orientation, students meet once a week for one-on-one instruction in outlining and word processing. Like so much of the work done in the LT program on study skills, learning to use the Macintosh computer as a writing tool is an invaluable aid to students in all of their academic areas. Provided with this skill in their LT training, students are better able to approach major writing assignments in other areas: the English critical essay, the History research paper, the Science Fair research write-up. The Macintosh may be, for many of our students, the key to becoming truly independent learners.

Pre-writing

The first step, *pre-writing*, involves brainstorming lots of ideas. We are using Acta, an outlining program, which aids us in generating and organizing our ideas. The next step of the process after the pre-writing stage is to expand the outline into complete sentences. Then the outline is moved into MacWrite for more expansion, easier proofreading and later formatting.

Writing

During the *writing* part of the process, the first focus is on content and clarity, rather than spelling, mechanics and aesthetics. (Spelling, mechanics and aesthetics are addressed during the re-writing stage of the process.) As we proceed, we revise the piece. Using MacWrite, revising is easy and not the long, painstaking task it is when one has to re-write drafts manually.

Re-writing

Finally, with assistance and instruction provided, the revised piece of writing is edited and a final product is produced (*re-writing*). Again, the editing capabilities of MacWrite simplify the process.

> "...Aron is generating his own words."

When Aron writes, he chooses his own topics and generates his own words although a teacher is available to aid with spelling when Aron becomes frustrated. What I feel is making a genuine difference is that *Aron is generating his own words*. In the past, words and topics have been supplied for him. Generating words and topics, as opposed to being supplied with them makes writing a personal learning process. For example, if Aron wants to know how to spell the word "skipper," and (even if) a teacher has to aid with the spelling, the spelling is bound to stay with him a long time, possibly forever. But, if a teacher chooses the word, it may not have meaning for him, and therefore will probably be gone by the next time he needs it.

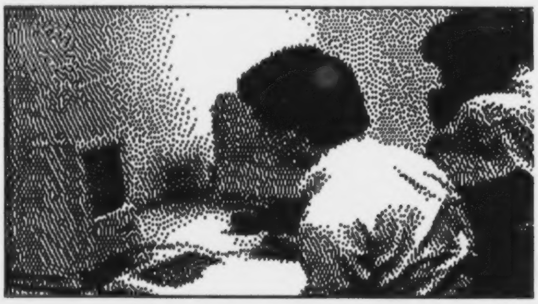
Traditional Lessons

Also, using the Macintosh as a writing tool, Aron and I are going through traditional lessons and having a higher spelling/reading success rate than when doing the same lessons using a pencil and paper.

Better Feelings About Writing

In summary, Aron is excited about using the Macintosh computer. He's going into the lab whenever he has a free minute. He's interested in writing, and even asking if he can write an article for this newsletter! This is something I believe Aron would never have attempted before his exposure to the Macintosh. I believe that this is due to his excitement about the tool itself, the satisfaction of the immediate aesthetic results, the editing possibilities, and the organizational strategies allowed by the Macintosh programs. One may feel that it's too early to have any criteria on which to base my reactions. Based on past teaching experiences, I know that getting the interest and excitement level up is half the battle when trying to find the answer to an educational problem.

Criteria I don't have yet, but just look at his eyes!



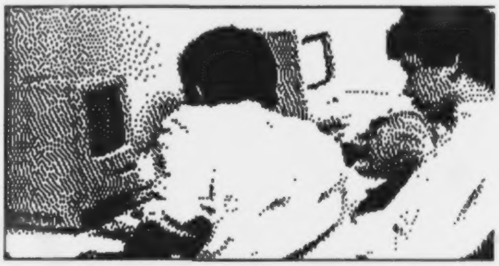
Other Developments at Forman

Timothy Shaw

"Age cannot wither, nor custom stale/Her infinite variety."
-William Shakespeare

Now that the Forman Macintosh Laboratory is in full swing, there's time to look around and notice how the Macintosh is being used in the community at large. It's nothing short of amazing how so large a group with so widely divergent needs and approaches can so readily--and so uniformly--embrace a new idea and run with it.

Most significant for Forman--indeed, the primary reason for the Lab's existence--is the impact on the Language Training Department. Dr. Laurel Fais has had a great deal to do with the assimilation of the Macintosh into the curriculum at The Forman School, and I refer you to her article on the LT Department and the Mac elsewhere in this issue.



Administrative Uses

The Admissions Office was one of the first offices to get its own Macintosh. The enormous amount of information that needs to be juggled around (student names, home addresses, gender, grade, dormitory, birthdate, advisor, test scores, etc.) and printed as different information lists is staggering. A database program like OverVUE, however, easily handles everything we would possibly need it for. Hours of typing time have been reduced drastically. Adding and deleting information is simple, and OverVUE can re-sort the information using any category we choose. The Admissions Office loves it, especially the secretary.

The Director of Transportation is using Excel, a spreadsheet program to produce weekly lists of the students who are going home for the weekend. He can tag the categories according to how they are traveling (bus, plane, private car, etc.) and whether they are leaving early, after classes on Friday, or sometime on Saturday.

OverVUE is also going to be used for our dining hall seating list. Students rotate to assigned seats every two weeks; some evening meals are also served by student waiters, who are picked and assigned every two weeks. OverVUE can print out a seating list and a waiter list much faster than the head of the dining hall can do it by hand.

Desktop Publishing

Imagine the impact when a place that needs to produce mounds of paper starts using MacWrite and Pagemaker. Our Director of Professional Services has begun a weekly newsletter called "Faculty Notes," using MacWrite, Pagemaker and a Laserwriter. It lists schedules, meeting times, upcoming conferences of interest, reports from committees, memoes from various offices, etc. It beats typing on a mimeograph master, and the Faculty are kept up to date by a weekly newsletter that looks slick and professional.

The Head of the Math Training Department has produced a manual for math training teachers. The Advisor to Student Government used MacWrite to organize and print the Student Constitution; each member of Student Government has a LaserWriter-printed copy, and the document is saved on disk so that revisions and amendments (one of the chief occupations of secondary school student governments) can be made easily and by the students themselves. The Director of Student Activities uses a Macintosh for generating and storing information and documents. The Director of College Counseling has produced a pamphlet for students and parents on college admissions using the Macintosh. Seniors are urged to use the Macintosh Lab to produce college application essays. School forms of all types are being produced in the lab with the Macintosh and LaserWriter.

Educational Uses

Faculty are lining up to use the available Macintoshes for end-of-term comments on students. Some of them do lesson plans, syllabi and worksheets for their classes on the Macintosh. A set of guidelines for writing papers has been produced for school-wide use, with MacWrite, MacPaint and MacDraw.

We have eight Macintoshes in the Lab (networked to two ImageWriters and a LaserWriter). As this article is being typed, another machine is currently occupied by a student typing an article for the student newspaper. The Faculty Advisor to the newspaper sits next to her, typing quizzes for her course. Behind me, the Head of the Math Training Department is using Acta to prepare an outline of a one-on-one math course. One machine over, a senior who has been very much turned on, is practicing with ResEdit. On the other side of him, Richard Wanderman is proofreading an article for this newlsetter, and further down, Emmy Pellico is using PageMaker to prepare next week's edition of "Faculty Notes." A student's parents have just walked in to look at the Mac Lab. They are interested in getting one for their son.

As I said: It's nothing short of amazing how the opportunities the Macintosh provides have been seized by the community. Every person who has taken the time to sit down with the Macintosh has become excited. The momentum is growing. The most difficult part is making the Lab available to all the people who want to use it. Fortunately, this is not an insurmountable problem. Given time, more and more uses for the Macintosh will be discovered as more and more members of the community become familiar with it and have access to it.

The possibilities may well be limitless; we intend to push those limits.

Contributors

Richard Wanderman has an MFA in fine and applied arts from the University of Oregon, Eugene. He has taught ceramics, design and computer-aided design at the University of Oregon for the past four years. He has also written, lectured and done workshops about the connection between personal computers and dyslexia. He is currently directing the Computer-aided Writing Project at The Forman School.

Timothy Shaw received a BA in English and Classics from St. John Fisher College in Rochester, NY, and an MA in Medieval Studies from The University of Connecticut. As a Graduate Student Teacher at UConn, he received the 1984 Award for Academic Excellence. He has taught English Literature at Forman since May, 1984. During the 1985-1986 school year, he was the only faculty member with a Macintosh. He currently teaches two sections of Composition on the Macintosh.

Emmy Pellico has a BS in graphic design from the University of Oregon, Eugene. She has produced a variety of publications for the University of Oregon and other Eugene businesses with the Macintosh and LaserWriter printer. She is currently assisting in the running of the Forman Macintosh Lab, teaching a variety of courses and producing some of Forman's publications in the lab with the Macintosh and LaserWriter printer.

Dr. Laurie Fais received her PhD in Linguistics from Indiana University in 1981. In 1982, Dr. Fais came to The Forman School to teach Language Training and act as Director of Professional Services. She is currently the head of the Language Training Department and is involved with the Forman Computer-aided Writing Project. Dr. Fais helped to write the Language Training Department curriculum and has presented papers on teaching linguistics to dyslexic adolescents and on the LT curriculum.

Karen Craig received her BA from Muskingum College in New Concord, Ohio. Since then, she has taught school in Pennsylvania and New Hampshire, where she was involved in curriculum development in the area of the *process approach* to the teaching of writing. She is a Language Training teacher at The Forman School and is involved with the Forman Computer-aided Writing Project.

Products Mentioned

Retail prices are in parentheses. Products can sometimes be purchased through mail order houses for less.

Macintosh 512K *enhanced* ($1699.), **Macintosh Plus** ($2199.), **ImageWriter II** ($595.), **LaserWriter** ($4995.), **MacWrite** ($125.), **MacPaint** ($125.), **MacDraw** ($195.). Apple Computer, Inc. 20525 Mariani Ave., Cupertino, California 95014. 408/996-1010.
Acta ($59.95), Symmetry Corporation, 761 East University Dr., Mesa, Arizona 85203. 602/844-2199.
Excel ($395.), Microsoft Corporation, 16011 NE 36th Way, Redmond, Washington 98052-6399.
OverVUE ($295.), ProVUE Development Corporation, 222 22nd Street, Huntington Beach, California 92648. 714/969-2431.
PageMaker ($495.), Aldus, 411 First Avenue South, Seattle, Washington 98104.

Next Time

In the next issue we hope to review a number of different programs of value to the dyslexic: MacPaint, MacDraw, MacVision, More, MacType, SpellsWell, MacGas, MacLightning; also, an in-depth look at Apple's hierarchical file system (HFS) and how it is being taught to our students. There will also be articles dealing with specifics of teaching writing to dyslexics using the Macintosh interface, setting up a users group at a secondary school, using a null-modem and communications software to write *conversationally* on each other's computer screens in the lab, how *interactive* exercises and games can become part of the education process, and speculation on the future of the Macintosh at The Forman School.

AppleLink

AppleLink is Apple's multi-purpose electronic bulletin board system. The Forman School will be getting an AppleLink address in the near future. We will discuss AppleLink as a resource and as a way to share information in the next issue of **The Macintosh Lab Monitor**. We will also let you know what our AppleLink address is so that those of you who are on this network can communicate with us directly.

Glossary

A list of education-oriented and computer-oriented terms which are either used this issue or will be used in future issues.

Dyslexia A neurological difference that causes difficulty with reading and writing. Dyslexia is a *developmental* disability: it can be affected by environmental factors.

Dysgraphia A neurological difference that causes difficulty with writing and other types of symbol making. Usually associated with dyslexia.

Kinesthetic Referring to the sensation of bodily movement. In the field of learning disabilities, used to denote a learning channel separate from *visual* and *auditory*. Kinesthetic learners learn best by "going through the motions."

Encoding Literally, to put into code. In the field of learning disabilities, used to denote the act of writing words.

Decoding Literally, to turn from code into plain language. In the field of learning disabilities, used to denote the act of reading, or pronouncing words.

Interface A place or piece of equipment where interaction takes place between two systems. The screen, mouse and keyboard of the Macintosh are the interface between the machine and the user.

Program A set of instructions that, when fed into a computer, control it. MacWrite is a program. Acta is another program. A program is written in a computer language (BASIC, Forth, C, Pascal, Assembler, etc.). "To program" is to write programs. **Application program** A program for doing a particular task. A word processing program like MacWrite is a writing application. A drawing program like MacPaint is a drawing application.

MacWrite A Macintosh writing (word processing) program.

Acta A Macintosh outlining program.

MacPaint A Macintosh drawing program.

MacDraw A Macintosh drafting program.

OverVUE A Macintosh database program.

Excel A Macintosh spreadsheet and business graphics program.

(Operating) System A collection of programs that operate a computer. Application programs need system programs to run.

Finder A Macintosh system program that manages files and directories of files. The Finder is a visual shell for the Macintosh operating system.

Folder A container for files. A way of visually organizing information.

System The System file contains the operating system of the computer. It also contains resources that all programs share. Some of these are fonts and desk accessories.

Hierarchical File System (HFS) The folder system that the Macintosh operating system uses to store files in a hierarchical fashion.

System Folder The Macintosh's system programs are all contained in the System Folder. Open the System Folder and you'll see them individually. The latest System Folder contains: Finder, System, Clipboard, ImageWriter, AppleTalk ImageWriter, LaserWriter and Laser Prep.

Mouse A small box-like attachment that, when moved on a flat surface, makes a cursor move on a computer screen. It is a powerful replacement for cursor keys for most applications.

Window A visual directory of the contents of a disk, folder or other container of information.

Icon A symbol. The MacWrite program symbol as displayed in the Finder is an icon.

Menu A list of choices, usually prompting you to make one or showing one you've made. The Macintosh uses pull-down menus that are accessed by clicking on them with the mouse.

File Information stored as a unit on a disk. Programs as well as the work done with them are files on a disk. Macintosh files are represented by icons or names in disk windows.

Disk A magnetized, round, plastic pancake in a hard plastic housing that holds information; programs and the files that you create with them. Sometimes called a "floppy disk." The Macintosh uses 3 1/2" disks where IBM PCs and Apple IIs use 5 1/4" disks. Single-sided Macintosh disks hold 400 kilobytes; double-sided disks hold 800 kilobytes.

Enhanced The term Apple uses to label 512K Macintoshes which contain the new Hierarchical File System in their ROM chips and have a double-sided disk drive. All 512K Macintoshes being produced now are *enhanced*.

SCSI "Small Computer Systems Interface." A standard for connecting devices, such as hard disks, to computers. The Mac Plus has a SCSI port; the Mac 512K enhanced does not.

Hard Disk A high-speed, high-capacity, fixed disk. A hard disk might hold 20 megabytes.

Kilobyte 1024 bytes (sometimes rounded off to 1000). Sometimes called a "K."

Megabyte 1024 kilobytes (sometimes rounded off to 1,000,000). Sometimes called a "meg."

Gigabyte 1024 megabytes (sometimes rounded off to 1,000,000,000). Never called a "gig."

Desk Accessory A small program that is accessible while a larger program is running. Acta is a DA.

Memory A component of a computer that holds information, some permanently, some temporarily. Memory is usually made up of arrays of chips. Strictly speaking, disk storage is memory; most people do not include disk storage when talking about computer memory.

RAM Random Access Memory. A RAM is a type of memory chip. The Macintosh has either 128K, 512K, 1024K or more RAM in it. There are banks of RAM chips soldered to the main circuit board inside the machine. RAM holds programs (MacWrite) and data (your writing) so that the microprocessor can work with them.

ROM Read Only Memory. A type of RAM chip that holds essential information and cannot be used by you to store new information. Parts of the operating system of the Macintosh are stored on its ROM chips. The Macintosh has either 64K or 128K of ROM. ROM is sometimes called **Firmware** because it's not quite hardware and not quite software, but a combination of both.

Pixel Picture Element. The smallest dot-units on a video screen. The resolution of a screen is determined by how many pixels the screen has. The Mac screen has an unusually high number of pixels on it (512 by 342).

Bit-mapped A way of handling a computer's screen so that a portion of the computer's memory is dedicated to holding the screen image (mapped, bit by bit).

Hardware The physical machine that you can see and touch. The Macintosh, mouse and keyboard are all hardware.

Software The information/instructions that make computer hardware work. Also called programs. A physical book is hardware, but the writing on its pages is software.

Network Sometimes called "local area network" or LAN. A group of small computers linked together so that they can share printers and other devices.

AppleTalk A LAN that connects Macintoshes to each other and to devices such as printers.

Mainframe A large, powerful computer which usually looks like a group of refrigerator-sized boxes hooked together. This type of computer allows many people to use it at the same time. There might be 20 or more *terminals* attached to the mainframe. A **Terminal** is a monitor and a keyboard. Mainframes have tremendous power and storage capacity and operate at very high speed. Large corporations, universities and government organizations use mainframes to store and work with large amounts of information.

Mini-computer A small mainframe.

Microcomputer A small, self-contained computer. Sometimes called a personal computer (PC). The Macintosh, IBM PC, Apple II and Amiga are microcomputers.

The Macintosh Lab Monitor

A quarterly publication documenting the Computer-aided Writing Project at The Forman School

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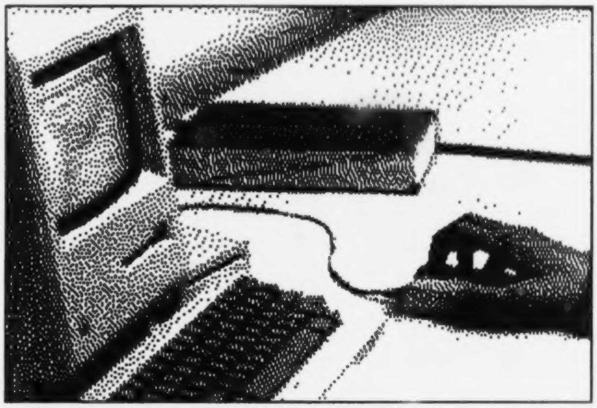

#2

Winter, 1987

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Project Overview

Richard Wanderman

The Computer-aided Writing Project at The Forman School continues to grow both in momentum and substance. The reason for our success and growth is that we are giving our dyslexic students a useful tool that is directly helping them with their writing and organizational problems. This newsletter is our documentation of the Project as well as other occurrences in the field that are of interest to educators.

Thank you for your enthusiastic feedback to the first issue of *The Monitor*. Your feedback is one of the things that keeps us fired up and eager to put the newsletter together. Both Tim Shaw and I, as well as the other contributors to this newsletter, are excited about what we are doing and enjoy writing and the sharing of our writing enough so that we consider producing this publication a personal pleasure.

Project Expansion

The Computer-aided Writing Project is expanding in physical space and in its curricular offerings. Next year we will be offering three new courses: an Introduction to Computer-aided Design, giving students another way to be introduced to the Macintosh; Advanced Macintosh, to offer students in the program this year a chance to continue with more advanced instruction; and Thinking and Writing, an experimental course which will combine many of the goals of our Language Training Program with the use of the Macintosh as a writing and organizational tool. We will also continue to offer Introduction to Computer-aided Writing and individualized Language Training work on the Macintosh.

An Innovative Physical Space

With this curricular expansion will come a physical expansion. Many of the above courses happen concurrently and we will need more computers and more space for them. We will be remodeling the Macintosh Lab over the summer, using neighboring classroom space and reorganizing the current space. The use of MacDraw on the Macintosh made experimenting with possible floor plans easy and allowed us to come to what we consider an excellent arrangement. Because all of Forman's classes are small (and this goes for our Macintosh Lab classes as well), we decided to divide our lab into classroom bays with no doors on them. This way, we can teach three classes concurrently and also use the entire space for hosting conferences and workshops. This arrangement also allows Emmy Pellico and me to float more easily, helping classes other than our own when they need it. It is nice to have come up with a physical arrangement that reflects our pedagogical ideas as well.

Interactivity

One of the themes of this issue is interactivity. In trying to put a handle on interactivity, I think we're getting closer to putting a handle on what makes the Macintosh such a special machine. We could say that the Macintosh is special because it is interactive, but that means little: other computers are interactive, too. Maybe there are qualities or levels of interactivity that can be assessed and discussed.

We have been experimenting with many different pieces of interactive software and hardware—null-modems, games, voice feedback programs—and we are beginning to create interactive environments with World Builder. We are finding that most software that runs on the Macintosh is interactive by nature because interactivity is built into the Macintosh's visual operating system. You learn new programs by interacting with them, not by studying them. This is made even easier by the fact that all programs which run on the Macintosh operate in essentially the same way; they share the same look and feel. This is one of the important attributes of the Macintosh that makes it a great learning machine. You don't have to use "instructional" programs because almost any program will do. Just give a person a disk and let him experiment and play. Each program is a self-contained system that can be figured out by trial and error. The more trial and error, the more opportunity for learning.

Interactivity in the Macintosh Lab

Laurie Fais

For teacher and student, especially in a one-to-one situation, interaction is the name of the game. It is the essence of what we as teachers do. We develop certain styles of interaction, usually differing from student to student, though only as variations on a theme. We are uncomfortable for a time when the student is new or does something unpredictable or doesn't seem to respond; we feel success and satisfaction when the interaction seems to generate learning. The whole process is thrown off kilter when the phone rings in mid-sentence or the supervisor comes to observe. We are more or less aware of what we are doing depending upon how reflective or how intuitive we are as teachers and as people.

What Happens

The Computer-aided Writing Project takes the one-to-one interaction of Forman's Language Training Department into the context of a computer lab. What happens? How do the dynamics of teacher and student change or remain constant when one of the two Lab Directors becomes a part of the learning process? And (a situation even further removed from the usual disruptions of teacher-student interaction), what happens when a machine, a computer, is introduced into the picture?

For six months now, approximately 25 Language Training teachers have been working with their students on an individual basis, one day a week, in The Forman Macintosh Lab. Most are there for a full class period; some go in a couple times a week for a shorter period of time to work on keyboarding skills. In all cases, initial instruction on the use of the computer was done by a third party, one of the two Directors of the Lab.

Introduction of Choice

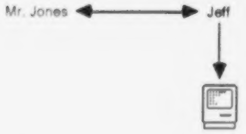
The major perturbation to the one-to-one relationship occasioned by work with the computer is the introduction of choice into the system. That is, interaction in the one-to-one setting consists for the most part of a series of alternating turns taken by teacher and student. As soon as a third party becomes a part of the relationship–even a machine–there is choice. Once one person's turn is over, who goes next? The other person? The computer? And who is the teacher addressing during his/her turn? Is he/she focused on the student or on the computer?

> "As soon as a third party becomes a part of the relationship–even a machine–there is choice."

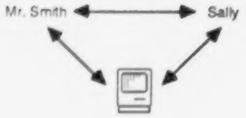
Three Factors

The choices made in the computer-aided writing setting are determined by many factors. In my observations of teacher-student interaction in our Macintosh Lab, I have picked out three factors that seem to be of importance for determining how the participants relate: the degree of comfort they feel when working with the computer and with each other, the importance of success in the session for both teacher and student, and the function of the computer in the interaction (is it a tool? a mediator? an incidental?). I can't begin to discuss each of these factors in depth, but I can give some thumbnail sketches that illustrate some of the considerations involved.

Two Vignettes



Mr. Jones sits close to the the table where his student Jeff is situated in front of and facing a Macintosh. Mr. Jones does all the talking, speaking in statements about what Jeff should be doing with the outline for the composition he is working on. Finally, Jeff looks at him bewildered: "Why am I doing this? Shouldn't I be relating this to my topic?" Mr. Jones pulls away and sits face-to-face with Jeff: "Once we establish this connection, then we can...."



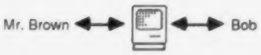
Ms. Smith stands behind her student Sally. They both watch the screen intently as Ms. Smith points to a word, jabs at the return key, and folds her arms as Sally types in an idea. Ms. Smith kneels down next to her; they converse briefly; Sally reaches for the mouse to make a correction and continues to work. In a moment, she looks up: "Can I do something else new? This is fun."

For Mr. Jones, his student's success at writing the outline is paramount; he virtually ignores the role of the computer and of the student's knowledge of the computer in achieving that success. This is partly because he is not entirely comfortable with the machine himself and so prefers to concentrate on the area he is comfortable with: the development of ideas in a composition. For him, the computer is an incidental. Jeff gets confused because he, being the one actually working with the computer, is committed to using the computer software framework (in this case, Acta, an outline processor) to develop his ideas, a framework that his teacher is not taking into consideration at all.

Ms. Smith, on the other hand, is focused on the computer as an essential tool; her communication with her student occurs as much through the medium of the computer as it does through conversation. In fact, in this case the computer is the mediator of the relationship. The student ends up learning something about how the machine works in addition to successfully completing a project using that machine, and enjoys herself.

In both these cases, the teachers' feelings about the computer had a great deal to do with whether they used it or ignored it in their interaction with their students. In other cases, the teacher-student relationship in the classroom determines how a third party, in this case the computer, gets incorporated into the relationship.

The Classroom Relationship



Mr. Brown and Bob had an uneasy classroom relationship. In the Macintosh Lab setting, where Mr. Brown was not particularly comfortable and where his student was a novice, the relationship continued to be poor. Mr. Brown was very much like Mr. Jones in that he paid little attention to what the computer could offer for enhancing their interaction. In fact, at times he seemed somewhat jealous of his student's concentration on the machine: as his student worked to produce a piece of writing, Mr. Brown queried him on a number of points. When Bob finished, Mr. Brown asked "Now where are the answers to *my* questions?"

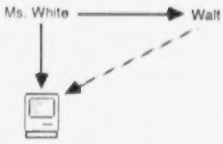
An enormous factor in the success of the work done in the Forman Macintosh Lab is the presence of two Lab Directors who did the initial training of teachers and students and who continue to float during Language Training working time with suggestions and interventions. Richard Wanderman had done a great deal of the computer work with Bob himself, recognizing the problems in the relationship between Mr. Brown and Bob. But at one point, he made the suggestion that Bob and Mr. Brown (rather than himself) should converse using the null-modem set-up to connect two Macintoshes (see "Conversational Writing with a Null-Modem" elsewhere in this issue). In this set-up, teacher and student each sit at connected computers and take turns typing text that appears on both screens. At first tense, Mr. Brown soon relaxed as he and his student conversed, generating much more written material than usual from which Mr. Brown could draw a number of point-of-error lessons.

"...the computer can go a long way toward opening new channels of communication that allow learning to take place."

In this case, the computer acted not as an incidental or even as a tool, but as a necessary mediator in the relationship between teacher and student. In cases where the teacher-student relationship is not a comfortable one, the computer can go a long way toward opening new channels of communication that allow learning to take place. Since the computer is a necessary mediator, the element of choice is eliminated; the alternation of turns familiar from the day-to-day work in the regular Language Training sessions is re-established and the threat of the machine as a competitor in a relationship is gone. In addition, the neutrality of a computer is such that its role as a mediator does not intrude on the teacher-student relationship, and its novelty is such that using it provides teacher and student with a fresh way to communicate.

Why Is Success Important?

In Language Training, we stress the importance of providing our students with successful experiences. We know how important those experiences are to the student in terms of his ability to continue to grow and learn. But very often the teacher has as much invested in the student's success for personal reasons as for the student's sake. That is, it is as important to the teacher that the student succeed for the feeling of success that the *teacher* will feel as for the sake of providing that success for the student.



Ms. White sits close to her student, Walt, and talks with him excitedly as he sits back in his chair and works deliberately on a piece of writing. He keeps one hand in his pocket while the other pecks away at the keys. As the piece of writing gets printed, Ms. White hovers over the printer and rips off the sheet, holding it out for Walt to see: "That came out nice. Aren't you smart?" They return to the computer to look at a problem. Ms. White reaches for the keyboard to type in the answer: "Oh, I get it!" Up to this point, Walt's input has been minimal—he did not engage himself fully with the computer (hand in pocket); he didn't even get to touch the finished product. He is reluctant to get excited; in a sense, his teacher is doing that for him. At this point in the scenario, however, one of the Lab Directors intervened with a smile, "Why don't you let Walt do it." He hands the keyboard over to the student.

The success of her student was so important for Ms. White that she was willing to go to some lengths to engineer it, and in a sense, create it. All it required in this case was a gentle reminder and the responsibility for achieving success shifted back to the student. This is a case where the teacher needed to restrain her own sense of urgency about having the student achieve on the computer so that he could, in fact, have the type of experience that would allow him that achievement.

I observed another teacher, Mr. Andrews, whom I talked with after the class about degree of teacher involvement. It was this teacher, in fact, who first raised this consideration with me in discussing his own attitude about the student he had been working with, Al. As I looked back over my notes, I was a little amused to see how Mr. Andrews had been physically restraining his own sense of urgency for success: "Mr. Andrews takes notes... sits back, arms folded,... hands in pockets," all geared to let the *student* be the one interacting with and learning from his experience on the computer.

A Variety of Interactions

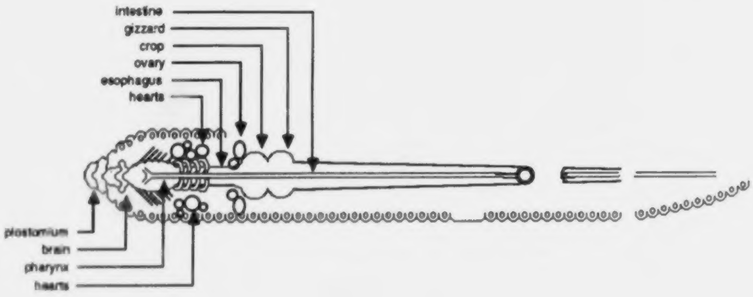
"A computer can... provide a necessary successful experience for a *teacher*."

The stereotypical "best" interactions among teacher, student and computer are those in which a comfortable teacher-student relationship comes to the computer to use it as an essential tool in a learning process that involves enough teacher input to generate excitement and information transfer and enough student engagement to ensure learning and enthusiasm. But this is not the only situation in which learning can take place. A computer can become a new channel of communication for a teacher and a student who do not have a good relationship, or can provide a necessary successful experience for a *teacher*.

Teacher-student relationships are as different as the teachers and students involved in them. This variety does not diminish when a computer is introduced as a third party; rather, it increases as the element of choice is introduced. A teacher may choose to face the student and direct all of his interaction to the student, or choose to use the keyboard himself instead of allowing his student to interact with the machine, or choose to let the student direct the interaction among the three of them. His choices reflect the effects of his past experience with the student and with the computer, of his personal need for the student to succeed and of his view of the computer as an incidental or as a partner in the learning enterprise. It is important for the teacher to be aware of these factors when he enters this three-way involvement. He may need to make a conscious effort to allow the student to experience the learning success; he may need to change his own view of the computer so that it can be as effective a partner as possible. And if, in fact, his relationship with his student is not always an easy one, his awareness is even more important; he may be able to manipulate the interaction so that the use of the computer can improve the teacher-student relationship, either by mediating the relationship and opening up more productive lines of interaction, or by allowing the student success in a new situation.

"...the computer has an enormous capacity for facilitating human relationships...."

We all know that a computer does not have human capabilities. But the computer has an enormous capacity for facilitating human relationships, especially in the learning environment. It is essential, then, that teachers be aware of that capacity and reflect upon how to make the most of it in their use of the computer with their students.



Earthworm drawing, done with SuperPaint by Edward McKeown, a Forman student, for a Biology paper.

Experiential Learning with the Macintosh

Tim Shaw

"Games lubricate
the body and the mind."
-Benjamin Franklin

Experiential learning is becoming a trend in education, notably at the secondary level. Not only is it an efficient method to keep students motivated and to drain off excess energy, but also it provides simultaneous access to all three learning channels—auditory, visual, and kinesthetic. More, experiential learning eschews rote memorization and promotes both critical analysis and synthesis of a solution.

Experiential Trail-blazing at Forman

At The Forman School, experiential learning has proven an invaluable tool because of its multi-modality nature. Forman's chief and most widely used experiential resource is Project Challenge which, besides teaching a course entitled Environmental Concerns, teaches both cooperation and self-sufficiency through rigorous excursions to New Hampshire's White Mountains and through the on-campus Ropes Course, a strenuous and sophisticated "obstacle course" that can be conquered neither alone nor easily.

Interactive Learning in Education

One of the allures of experiential learning is that it is *interactive*; that is, it allows stimulus-response-feedback-response experience. Put more simply, experiential learning allows the student to respond to a situation and receive immediate feedback to his response. This give-and-take is the best kind of learning. (Teachers know how eagerly students want their assignments returned to them, and how disgruntled they become with a teacher who does not give them the feedback they desire.) In the Forman Macintosh Lab, students have had great success with a null-modem set-up which allows them to converse via Macintosh with a teacher or another student. Dyslexic students who never write more than the minimum required of them are now producing hundreds of words of logically connected prose in a single 40-minute period. The motivating factor is the immediate response they get from whomever is on the other end. (See "Conversational Writing with a Null-Modem" elsewhere in this issue.)

Games

An unexpected—almost serendipitous—source of interactive learning is the burgeoning number of interactive computer games, usually intended to entertain. These can range from the relatively simplistic Transylvania to Enchanted Scepters (fantasy role-playing games) to Real Life. The last is produced by Relational Systems Corporation, and seems to be the first foray into Macintosh role-playing games by The Gideons, the Christian organization responsible for putting *The Bible* in hotel and motel rooms. The user travels city streets and through various buildings, encountering and interacting with different characters and objects (the program uses digitized images, although it is text-oriented); how you interact determines length and quality of life and your fate after death.

Multi-Sensory Gaming

That a computer game is visual is obvious. The best computer games (like the best textbooks or presentations of any kind) are visually stimulating to both left- and right-brained individuals. The three games mentioned above each use text and graphics on the screen at the same time. By now it should be superfluous to point out that the Macintosh's high-resolution monitor is ideal for both text and graphics. The Macintosh also has remarkable sound quality and versatility. The Macintosh has a built-in capacity to hold digitized sounds, and games can and do present the user with doorbells, knocks, various guns, bird songs, explosions, bats, squeaks, etc. Synthesized speech for the Macintosh is also available, and is used in programs such as Racter, which carries on a conversation with the user. Kinesthetic involvement is apparent through the use of the keyboard and mouse. Most of the user's faculties are engaged in the game.

Why They Work

The noteworthy facet of these programs is that they are interactive; that is, they require an immediate response from the user and produce either feedback or a counter situation almost immediately. They are beneficial for perhaps no other reason than that they motivate the user to think and stretch his brain in ways he does not normally use it. There are chiefly three ways in which the user is forced to think: analyzing a situation, making logical associations/synthesizing solutions, and using precise and proper diction during communication.

Analysis in Fantasy Role-Playing

Too many students give up too easily. Students with a learning disability who have experienced more failure than most give up almost without conscious effort. Fear of failure and an attention deficit inhibit any educational exercise that is not exciting for the student. There is a limited number of ways that games can be used to liven up the curriculum, however, and so many "games" that teachers choose as "fun work" (Scrabble, mock game shows, etc.) are not considered exciting by the student, especially once the novelty wears off.

Fantasy role-playing (FRP) games present the student with an exciting problem whose novelty does not quickly wear off. Unlike the standard games mentioned previously, conquering each step in the FRP game presents—not just another step—but another different step. Whereas quiz games and Scrabble rely on memory and analyzing word structures again and again, the FRP game presents numerous situations which require various solutions. Each computer screen of the game offers an entirely different verbal and graphic scenario to be analyzed.

Making the Right Connection

The usual *modus operandi* for the FRP computer game is to place objects important to the solution of the problem somewhere nearby. The pieces of the puzzle are there—just in different places. Distracting the cat can only be done if you think first to get the mice; a pillow lying on the ground in the middle of nowhere makes no sense, until you remember the crystal orb that shattered earlier when it fell (I overlooked this for a long time in Enchanted Scepters until one of my students pointed out the "obvious connection"). Memory and the ability to make associations are exercised willingly to a degree unusual in ordinary academic situations.

Ability to recognize spatial relationships is also exercised in these games. The user moves through a three-dimensional world (World Builder is an excellent program that allows you to construct various topographically related scenarios). Each scenario includes information about the immediate area and what directions are available. You must remember whence you have come if you want to backtrack to find an object you have not picked up or if you want to flee to some safe haven from an errant monster.

Precision of Speech (or, How Computer Limitations Help)

Precise diction and proper syntax are necessary for communication with the program during these games. If the user wants to pick up a sword, he must type "get sword" and not "getsword" or "get sord" or "sword" or anything else. Proper spelling and syntax are vital if he wishes to progress. The reason is simple: the program running the game is limited enough that it can only recognize certain exact commands. Although I am sure it causes frustration, I appreciate that students playing certain interactive adventures need to pay more-than-usual attention to their spelling during their playtime, *and they do it.*

They Can't Believe I'm Pushing Games

I do not know of any software that currently falls into the category of "games" that I would consider using as part of a curriculum. I simply agree with Franklin, quoted above. That the Macintosh is a vehicle for stroking both sides of the brain, for multi-sensory learning, and for recreation accentuates its appropriateness as the computer of choice of the younger generation, an endorsement with which I strenuously agree.

Conversational Writing

Richard Wanderman

Oral Conversation

When people converse orally, the bandwidth of information exchange is broad: language content, grammar, word order, word use, inflection, body language and gesture, context and a lot more. All of this contextual information is extremely useful in getting ideas across and we miss it terribly when we go to write even a simple set of instructions.

Conversing orally is personal; usually we converse with one or two other people whom we know. We find it awkward to converse orally with strangers; it's hard to know where to start, what to say and what not to say.

Many dyslexic people seem to have highly refined oral skills. By "refined" I do not mean that dyslexic people necessarily know how to use the English language "correctly" when they speak. They have become skillful (out of necessity) at conversing orally, and they use this skill daily because they find it difficult to express themselves in writing; it's a survival skill.

Writing does not need much of the taken-for-granted contextual information that we have at our disposal when we speak. Also, formal writing makes it hard to use those other references that give oral communication perspective.

There are many reasons why people (dyslexic or not) find it hard to write. One reason might be the fact that conversational writing is not something that we do often or are skilled at.

Conversational Writing

There are different ways to write "conversationally." You can write to a specific person or people, you can write dialogs between people, or you can write dialogs to yourself. For people who are having a hard time with writing, writing in this way can make the writing process more enjoyable and easier to get started.

Audience

Just writing with a conversational style is not enough. It is also important to have a focus, an audience to whom the writer can speak. This is true of most communication. Knowing the recipient of the information means that the information can be customized—made more meaningful and understandable.

Correspondence

One form of conversational writing that many of us take for granted and which has a specific audience by default is correspondence. The audience is known. There might be common language based on common experience. This shared context makes communication, and so correspondence, easier. Liberties can be taken with writing that couldn't be taken otherwise. Things can be referred to with short phrases that for anyone else would need pages of explanation. You can take chances with your writing.

A Personal Anecdote

I learned how to write by writing letters—thousands of them. I wasn't thinking about the writing; I was thinking about communicating. I had a purpose, and letter writing allowed me to share my ideas informally. Being dyslexic, my letters were full of spelling mistakes, but I sent them out anyway. I didn't have the wonders of electronic editing to allow me to edit easily. But, in writing all of those letters I learned a lot about writing and, more importantly, about the importance of expressing myself.

I became so reliant on the letter form that later, when asked to write an article for a magazine, I put its first draft in the form of a letter to get it off the ground. Only later did I remove the letter references. This helped tremendously.

Conversational Writing with a Computer

Electronic editing makes the use of a computer ideal for letter writing. One can write comfortably without worrying about typos, spelling, and organizational problems, and clean things up later. In addition to this, computers open up many other ways to share information conversationally.

Shared Story Writing

We call one of the exercises that we do with our students in the Forman Macintosh Lab "shared story writing." We have each of eight students start a piece of writing on his/her computer. After five minutes we have them move one computer to their right, read what was written on it, and extend the writing for another five minutes. We continue this rotation until all of the students have written on all of the computers. The resulting stories are wonderful and we read them aloud together.

We also do this exercise with just a teacher and a student. The student starts a story and hands the keyboard over to the teacher, who then extends it. They switch off this way for an entire class period. After they print the resulting story, they go back and look for problems in it together.

Null-Modem

Another way to use computers to write conversationally is to hook two computers together with a special cable called a null-modem (described elsewhere in this issue) so that two people can type back and forth, each seeing both his own and the other's writing on the screen. This set-up produces some of the most wonderful conversational writing we've seen in the Lab. It seems very close to oral conversation in both its spirit and its content.

Telecommunicating

Another conversational writing possibility is to use a computer and a modem to connect with an electronic bulletin board system (BBS) via the telephone lines. The BBS might be next door or halfway around the world. Calling a BBS facilitates writing letters to other people who also call the BBS to pick up mail and write letters. This is not real-time conversation, but one writes letters just as one might write paper letters, conversationally. BBSs provide much more than just electronic mail (E-Mail), but E-Mail is a big part of their use. People enjoy conversing in this way so much that some BBSs have something called "CB mode" (from Citizen's Band radio), where you can converse with people in real time.

Faster Feedback

Traditional letter writing means taking the printed output of your writing, placing it in an envelope and mailing the envelope. The envelope is then either trucked or flown by plane to its destination. Electronic distribution of letter writing changes this process radically. It allows many people all around the world to have access to each other's writing simultaneously and immediately.

What We Are Learning

It has been our working assumption from the birth of this Project that for our population of students, more exposure to the entire writing process will produce better writing. Many dyslexic people don't learn to write because they don't see a purpose in going through what, for a dyslexic person, is an agonizing process. By exposing our students to conversational writing in a way that can be enjoyable for them, we hope to broaden their idea of what the writing process is all about and show them that writing can actually be more than just a struggle.

Conversational Writing with a Null-Modem

Richard Wanderman

Sometimes we stumble upon things completely by accident and only in retrospect see how important they are. The key is to not throw things away too early just because they weren't planned. Such was the case with the use of null-modems in our Macintosh Lab.

Background

I have an advanced computer student, Jon, with whom I work individually. He is an incredibly bright and capable young man and, interestingly, one of the more language disabled students in the school. He wanted to learn more about AppleLink (an electronic bulletin board system operated by Apple) so he could use the bulletin board to exchange information about a project he is working on at school with a mathematics professor at the University of Oregon. I told him that I thought it would be worthwhile for us to learn more about telecommunications in general in order to give AppleLink some perspective.

Simulating Telecommunications

AppleLink is so easy to use (a definite plus in any other situation) that there is little chance to learn much about what is going on behind the scenes while using it. I thought it would be appropriate for Jon to learn about telecommunications right in our own Lab by hooking two computers together and *simulating* a real telecommunications session. This is done with a special wire called a null-modem. The day after I gave Jon a wiring diagram, he had a null-modem soldered and ready to use. In a week he was comfortable with telecommunications and the next week he was on AppleLink. Jon is now an active participant on the AppleLink network and you can write him at our address.

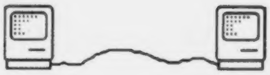
What Is a Modem?

A modem is a device (a small box, a piece of hardware) that allows a computer to communicate with another computer and modem over phone lines. The word "modem" is a contraction of **mo**dulator and **dem**odulator. A modem turns the electrical impulses in the computer into sound that can be transmitted over phone lines (modulated). It also takes the sound on the phone lines and turns it back into the electrical impulses that a computer can deal with (demodulated). The modem is the hardware, the little black box, but the hardware doesn't work without software. So, we have a classification of software called telecommunications software. There are many such programs that all do essentially the same thing: they control a telecommunications session between two computers. Each computer runs its own software and has its own modem.

What Is a Null-Modem?

A null-modem is a cable (a group of wires) that is set up to allow the computers at either end to communicate directly, without modems and phone lines. The two computers are usually in the same room, although they can be up to a mile apart if you have a lot of wire.

What We Do



Two people take the null-modem wire and plug it into the phone ports on the backs of two Macintoshes. Then, they each run a telecommunications program on their respective machines (we use MacTerminal). Once the program is up and running they can type back and forth, seeing both their writing and the other person's on their screen. The editing capabilities of MacTerminal are minimal—it isn't quite like working with a word processing program—but that isn't much of a concern since the idea is to converse without worrying about spelling or typos.

A Popular Diversion

Initially, Forman students were leery of using this set-up for a number of reasons:

- They had finally gotten used to editing their writing and they didn't like the idea of leaving a lot of mistakes standing (MacTerminal doesn't allow standard text editing);
- They weren't quite sure what the point was since they were so used to writing papers that this form of writing felt awkward;
- Without a good conversationalist on the other end, starting was awkward.

Now, as students and teachers alike have gotten used to this form of writing, it is one of the most popular exercises in the Lab.

Many teachers converse with students this way, print the transcript, and then go back through it outside the Lab to do point-of-error instruction. Also, teachers find this form of writing back and forth with their students a useful warmup—it can make other forms of writing easier to get started with.

Building a Null-Modem Cable for the Macintosh

If you have two or more Macintosh computers and you would like to try this, here are some instructions for building a cable. This cable will plug directly into the phone port of any Macintosh except the Macintosh Plus, for which you will need an adapter. The adapter can be purchased from an Apple dealer.

Tools

small, flat blade screwdriver
soldering iron
solder
wire stripper
continuity tester
paper clip

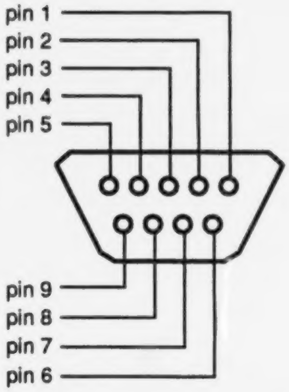
Materials

5 or more feet of ribbon cable with at least 7 strands
2 DB9 male connectors
2 hoods for the DB9 connectors

All tools and materials can be bought at Radio Shack or most electronics supply stores inexpensively.

Procedure

1. Separate the ends of the ribbon cable and strip seven of the individual wires.
2. Using the diagram on this page, solder individual wires to pins on the DB9 connector.
3. Repeat this for the other end of the cable.
4. Use the continuity tester to make sure the connectors are hooked together correctly. Use the paper clip (un-bend it) to touch the small pins on the DB9 if the blade on the continuity tester is too large.
5. Attach hoods to both DB9 connectors to protect the solder joints from wear.
6. Connect finished null-modem cable to the phone ports on the back of any Macintosh (except the Plus, for which you will need an adapter).



End of DB9 as viewed from the solder end (back side) of the connector

DB9 #1		DB9 #2
pin 1	◄──►	pin 1
pin 2	no connection	pin 2
pin 3	◄──►	pin 3
pin 4	◄──►	pin 8
pin 5	◄──►	pin 9
pin 6	no connection	pin 6
pin 7	◄──►	pin 7
pin 8	◄──►	pin 4
pin 9	◄──►	pin 5

Telecommunications Software

There are many telecommunications programs available that are more than capable of handling null-modem communication between computers. Most of the telecommunications programs on the market are designed for sophisticated uses, well beyond our needs for null-modem communications. See your local Macintosh users group for public domain (free) telecommunications programs. Or, see your Apple dealer for any of the commercial programs. We are using MacTerminal (a commercial program from Apple) but we have also used Microphone, which seems to be a better program. Again, for null-modem communications, you don't need a full-strength telecommunications program.

Complex but Do-able

Setting up telecommunications software may well be one of the most complex tasks there is in the world of computing. Don't let this stop you. Unless you are interested, you don't have to understand telecommunications in a detailed way, you just have to follow some instructions.

Local Echo

Simply, when my computer sends something to yours, what I see on my screen is the echo of what my computer sends to yours. If I type a word, I won't see it on my screen unless you actually receive it and your computer sends mine the okay to display it. This is called local echo. To share writing with a null-modem, this feature has to be turned on, otherwise I won't see my own writing but only yours (something you might want to try sometime for fun). In most telecommunications software there is a way to turn this feature on or off.

Baud Rate

Baud rate is the speed at which computers communicate over telephone lines. The three standard baud rates in the telephone world are 300, 1200 and 2400. In order to communicate at 2400 baud on a telephone line you must have a modem capable of communicating at 2400 baud. Some communications software allows baud rates that are higher than current telephone lines and modems allow. For instance MacTerminal allows baud rates of 19,200. Even though regular telephone lines can't handle 19,200 baud (yet), our null-modem cable can. Find out where in your telecommunications software the baud rate is adjusted and change it to its highest setting.

Dealing with Disks

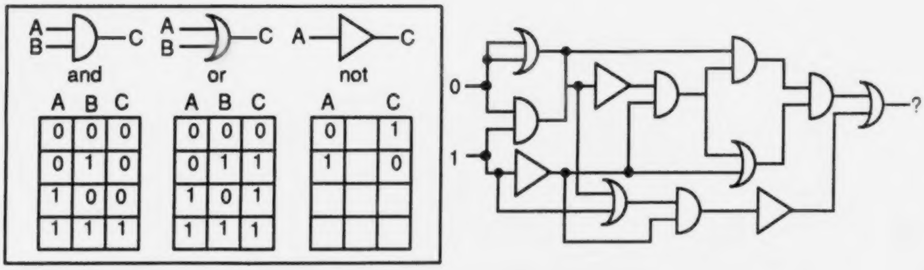
Make sure you do the same thing to each disk that is going to be used in the communications set up. Better yet, adjust the settings of the communications program on one disk, save the settings and then make a copy of the disk. You'll now have two disks that are the same. The reason for this is that if the two computer-modem setups are working at different speeds or there are other differences in the way the communications software is set up, the computers won't be able to communicate.

Other Computers

If you have other types of computers you can certainly do all of this with them; the only difference will be the exact wiring and pin diagram and the type of software you use. Contact your local computer users group for more information on any of this.

More Information

This has been a rather technical (by some standards) explanation. The reason we include it here in so much detail is because we are convinced of the effectiveness of this form of conversational writing in getting our students to write more, and we want to facilitate others trying it with Macintoshes. If you don't have time or don't know how to get started with this but would like to try it, see your local Macintosh users group or write us and we will be glad to help you get set up.



A	B	C
0	0	0
0	1	0
1	0	0
1	1	1

A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

A		C
0		1
1		0

Logic gate drawing, done with MacDraw by Jonathan Zeitler, a Forman student. Use key on left to trace circuit. What is the final value?

AppleLink

Richard Wanderman

AppleLink is the name of a large multi-purpose electronic bulletin board and network that is owned and run by Apple Computer, Inc. The bulletin board is based in Detroit, Michigan and is running on a number of large, mainframe computers leased from General Electric by Apple.

History

Apple designed and put AppleLink into effect to help Apple dealers communicate better with its Cupertino, California headquarters. Dealers use AppleLink to place orders, ask questions about servicing computers, and communicate with other dealers on the network.

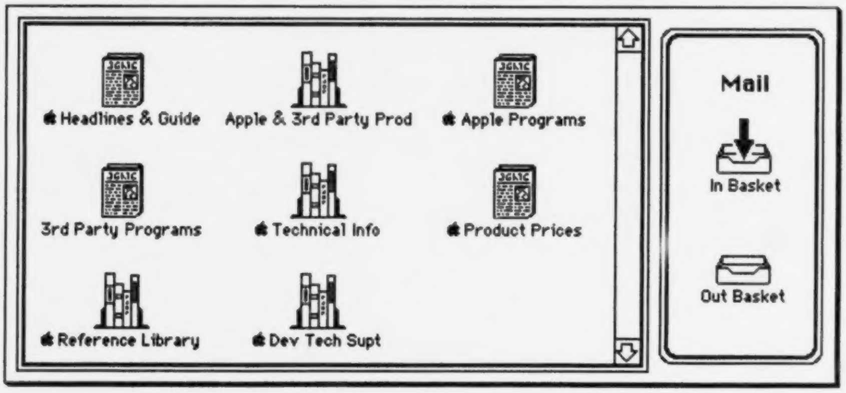
AppleLink has become such a useful tool that now there are many other organizations using it: developers of products for Apple's computers, universities using Apple computers, and some K-12 schools using Apple computers.

K-12 Uses

There are two main uses of AppleLink for educators: electronic mail (E-Mail) and database searches.

AppleLink allows you to send and receive E-Mail to and from other users of the network. E-Mail is simply an electronic letter, a way of sending information without paper. You type a letter on the computer and send it to someone else on the network.

The AppleLink Interface



There are listings of news items, technical information, a product catalog, and product prices. You can also search a number of databases for information about Apple products as well as many other products associated with Apple computers. There are numerous pieces of information about how Apple computers are being used in the field of education, and specifically the field of special education.

Databases are searched by typing the key word or words you are looking for and looking through the titles of the documents displayed. When the information is found you can save it on disk and/or print it immediately.

In a typical AppleLink session you might save ten different documents, including some letters and information about products, on disk. Rather than waste valuable network time (which you are paying for) printing documents, you can disconnect from the network and open the documents with MacWrite (if they are text files), edit them and print them.

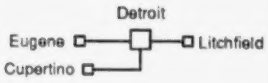
You can also send files created by any Macintosh program to anyone else on the network.

Typical Use

I have a friend at the University of Oregon, Dick Koch, who is a developer of Macintosh software. I asked Dick to send me a small utility program that he wrote (to give older Macintosh programs zoom boxes when they don't have them). It is a small program, only 2K, and it wasn't worth sending a disk through the mail to get it. Dick sent the file to my AppleLink address; the file sat on the mainframe in Detroit until I called and picked it up.

What Is an Address?

My AppleLink address is my network mailbox. It is a way for other people on the network to communicate directly with me.



Detroit is the hub of the network (the "bulletin board") and everyone, even Apple, calls there to pick up mail and receive files. It works much like any other hub system. For example, Federal Express uses Atlanta as its hub. All packages go through Atlanta, no matter where they are sent from or where they are going. Even if someone sends a package from Los Angeles to San Francisco, that package goes through Atlanta. Airlines also use a hub system with one particular city as the hub. Many airlines use Chicago as a hub because it is centrally located.

Electronic bulletin board systems (BBSs) are all hub systems where people call in from the surrounding area (in many cases the rest of the world) and exchange information.

Some Effects

A BBS "flattens" hierarchies. When I used the University of Oregon's bulletin board, I could write a letter directly to the president of the University and get a response from him personally. On AppleLink, I can write a letter to anyone at Apple, including John Scully, the president of the company. John Scully doesn't know me, but my writing looks the same on his screen as anyone else's. Just being on the network gives a person a certain amount of instant credibility.

Some things are more easily written than said on the telephone. Yes, the telephone is many times more direct than electronic mail, but E-Mail allows you to take your time, making sure you've included all of what you want to say. How many times have you hung up on a long-distance business call only to remember an important idea you forgot to mention? E-Mail helps eliminate that problem.

Telecommunications Is Useful

Telecommunicating is so useful that once you get used to communicating in this way you wonder how you ever got along without it. At the University of Oregon, I used our University network routinely from home each morning before I went to school to find out about the day's meetings. My department announced many of our meetings electronically since almost everybody in the department had a computer at home and used the BBS regularly. (No, it wasn't the Computer Science Department; it was the Fine Arts Department.)

Adheres to the Macintosh Interface

AppleLink is easy to use because it smooths over the complexities of telecommunications. It also completely adheres to the Macintosh visual interface and works like any other Macintosh program. AppleLink is like no other telecommunications program that you can buy.

How to Subscribe to AppleLink

Not everyone can subscribe to AppleLink. At this time, only Apple dealers, universities, Apple-certified developers and K-12 schools which Apple has deemed "Strategic Sites of Influence" can apply for an AppleLink address. If you are interested in AppleLink, contact Apple Computer, Inc.'s regional office nearest you for information and an application.

AppleLink Fees

It costs us $300 a year to subscribe to AppleLink. This is a flat fee that entitles us to limited monthly use. If we go over our allotted free time, we pay an hourly rate. Our flat fee arrangement is no longer available from Apple. Now there is a monthly charge of $12.50 per hour minimum. For more details on AppleLink fees, see your Apple dealer or Apple regional representative.

Worthwhile

We feel that our AppleLink subscription has been worthwhile. It has allowed us to see what other schools are doing in the area of special education and has helped keep us up-to-date on what is currently happening in the world of Macintosh computing.

Our Address

The Forman School Computer-aided Writing Project's AppleLink address is K0564.

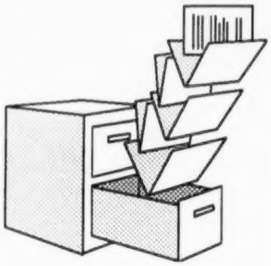
HFS: A Visual Filing System for the Macintosh

Richard Wanderman

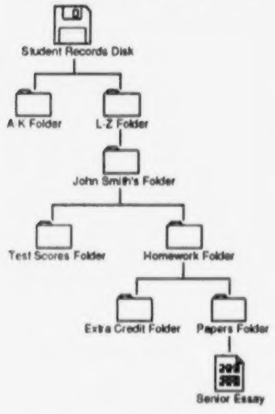
Apple Computer, Inc.'s new hierarchical file system (HFS) is built into all new Macintoshes with 128K ROMs (the Macintosh 512K *enhanced* and the Macintosh Plus). HFS is the most intuitive and easiest to use hierarchical filing system for dyslexic people using computers that we have seen. This is because, like many other aspects of the Macintosh, it is based on a visual, real-world metaphor. We make a point of teaching all of our students how to navigate this file system so that they can store their work in a way that makes it easier to find later. Below is a description of what a file system is and what the differences are between Macintosh file systems and others.

File Cabinet

A file system is a way of storing information to make it more easily accessible later. You might have a two-drawer file cabinet devoted to the students in your school. Each drawer might represent a certain portion of the alphabet: the top drawer, A-K, and the bottom drawer, L-Z. If you wanted to get a file for John Smith, you would go to the bottom drawer and look through the "S" section for Smith. You might have more than one file on John Smith so you could have a large John Smith Folder that contained other folders; for example, a Homework Folder and a Test Scores Folder. Within the Homework Folder might be two more Folders: a Papers Folder and an Extra Credit Folder. This is a hierarchy of folders. The hierarchy makes it easier to move through the system to find what you want. If you want to find a paper that John Smith wrote, you go to the John Smith Folder, then to the Homework Folder, then to the Papers Folder and, finally, you look through that folder for the specific paper. It is an intuitive branching and sorting process that, because it's so natural, is hard to forget. It is also hard to forget the "path" to certain information, because each node on the path is a natural superset of the item being looked for.



Hierarchies



A hierarchy is a group of things (or people) arranged vertically so that things (people) on top influence things (people) on the bottom. A common hierarchical situation would be a typical business. There might be a president, middle management, supervisors and workers. Another example is the John Smith example above. One moves down through the hierarchy as follows: file cabinet, drawer in file cabinet, "S" section of drawer, John Smith Folder, Homework Folder, Papers Folder and, finally, the actual paper of choice.

A "flat" file system would consist of one level—one folder with everything in it. There would be no opportunity to create different levels or sub-categories. A hierarchical file system allows for levels and sub-categories—a hierarchy. A flat file system means that if you've got hundreds of files in one place, you've got to look through all of them to find the one you are looking for. A hierarchical file system means that you can, through a process of branching into sub-categories, find what you are looking for much faster because as you branch you are eliminating looking through portions of the entire system.

A Computer's File System

Like a file cabinet, a computer's file system is a way of storing and retrieving information created with the computer. Unlike a file cabinet which is concrete, many computer file systems are abstract.

Command-Line Driven

MS-DOS (Microsoft Disk Operating System) is an abstract or command-line driven file system. This means that, to find a file, you have to type commands on the keyboard instructing the computer which file to find and where to look for it. MS-DOS is a hierarchical file system, but navigating the hierarchy is command-line driven and abstract. For most computer users, a command-line driven file system is hard enough; for the dyslexic person who might have a hard time with spelling accuracy or abstract directionality, it is an un-needed burden. The time that it takes to get to the point of comfort with this type of system isn't worth the effort. (For more on command-line driven computers, see "The Macintosh Computer and Dyslexia" in issue #1 of *The Monitor.*)

The Desktop Metaphor

Wisely, Apple extended the Macintosh's visual desktop metaphor to its file system. When running the Finder, you see windows which contain files and folders. You can re-name and nest folders to create the type of organization you want. You can easily and quickly set up the folder system described above in the John Smith example. With HFS you can save files to specific folders from within applications and search through folders for files from within applications. This capability doesn't exist on Macintoshes with older ROM chips that don't use HFS.

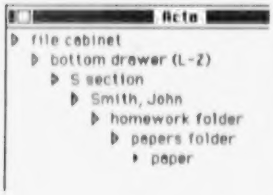
HFS History

The first Macintoshes to come out had flat file systems. There were folders to store things in, but those folders were only cosmetic. You did not see them when you were in an application looking for a file. You only saw them when the Finder was running (when at the "desktop"). All Macintoshes being produced now have the new hierarchical file system built-in. Many new Macintosh users take this file system for granted. Also, many new Macintosh users don't know how to use HFS to their advantage.

Apple was forced to come up with HFS as the Macintosh became a more sophisticated machine. Early Macintoshes didn't have enough disk storage capacity to warrant a hierarchical file system. With the increase in disk capacity from 400K to 800K there needed to be a way of easily moving through the potentially numerous files that could exist on one disk. And with a hard disk which might hold 20 megabytes (the capacity of approximately 25 disks), the need became acute.

Reinforcement with Acta

Working on a lineal outline is much like working in a hierarchical idea system. As we familiarize our students with the idea of containment—that one level might contain another—they are finding it easier to use this idea when they have the opportunity. The above John Smith folder system can be portrayed in Acta. (Note that, in Acta, a hollow triangle denotes a topic which contains a subtopic.)



Acta

- ▷ file cabinet
  - ▷ bottom drawer (L-Z)
    - ▷ S section
      - ▷ Smith, John
        - ▷ homework folder
          - ▷ papers folder
            - ▸ paper

The outline in the margin doesn't show the entire folder system but a path from the top of the hierarchy to a particular document. We know that there are also other folders and papers in the John Smith Folder, but we don't need to look through them to get to the document we want.

Observations

Learning to use HFS is a matter of spending time working with the Macintosh. We have found that the students who spend more time working with the machine are the ones who learn the HFS concept most quickly. It isn't a matter of studying, or that these students who use the machine a lot are more intelligent and because of this are taking to it more easily. It is simply a matter of repetition: learning by doing. Then there are the students who own and use their Macintoshes daily. For these people HFS is a tool that they use to their advantage. It keeps them organized (imperative for the dyslexic student); it works for them. It is also relatively transparent to them—they take its use for granted—just as Apple undoubtedly intended things to be.

Recent Developments at Forman

Richard Wanderman

Apple Computer, Inc.

When our regional Education Representative from Apple, Robin Fryer, came to the Lab for a visit, she was impressed enough with what we were doing to carry the news to Cupertino on one of her regular visits. She talked with Alan Brightman and Robin Coles of Apple's Office of Special Education and they agreed to donate two Macintosh 512K *enhanced* computers with external disk drives to our Lab for use in our Computer-aided Writing Project. One of the stipulations of the donation agreement was that we would document how the computers are being used. This newsletter is serving as that documentation.

Symmetry Corporation

In the first issue of *The Monitor*, Tim Shaw wrote a short description and evaluation of Acta, an outlining program that we use in the Lab with our students. Recently, a representative of Symmetry Corporation, the publishers of Acta, called and told us that she was so pleased with the article that she wanted to use it in Symmetry's advertising. She also asked what Symmetry could do for our Computer-aided Writing Project. I gave her numerous ideas on how Symmetry could help us. She seemed sincerely interested, and we expect to hear more from Symmetry.

Daniel Lewis Paul

One of our recent graduates, Eric Abramson (one of the chief Macintosh fanatics on campus last year), visited Forman two months ago. He was impressed with the Macintosh Lab and with *The Monitor*. He knew someone at Apple Computer, Inc. to whom he wanted to send a copy of *The Monitor*, so we gave him several copies. A week later we received a call from Daniel Lewis Paul, who works with the Apple-label software group at Apple's Cupertino, California headquarters. Daniel talked at great length about how great he thought our efforts are and how *The Monitor* is one of the best newsletters he's seen. He also offered his support and said to call him directly if we ever needed to talk to anyone at Apple about anything.

Alps and MacProof

We received a call from the director of marketing at a company called Alps Systems, the makers of a program called MacProof. MacProof is a spelling checker and writing analyzer. We should have a review of MacProof in an upcoming issue.

Council for Exceptional Children

We received a call from Robin Coles of Apple's Office of Special Education. She asked if we might be interested in working in Apple's booth at the CEC conference in Chicago this April. She wants us to demonstrate how we are using the Macintosh to help our students compensate for their writing problems. Tim Shaw, Jon Zeitler (one of our students) and I will fly to Chicago to demonstrate, talk, network, distribute information and get the word out about how we are using the Macintosh in our Project.

Connecticut Secondary Schools Macintosh Users Group

Recently we were visited again by Robin Fryer, Apple Computer, Inc.'s Regional Educational Marketing Representative. She came at our request to talk about setting up a statewide Macintosh users group for Connecticut educators. She agreed to underwrite a meeting that Forman's Computer-aided Writing Project faculty will lead in Apple's Glastonbury, Connecticut offices in May.

Orton Dyslexia Society Conference in San Francisco

We have been asked to make a presentation and lead a workshop at this national conference next November. We will lead a two-hour workshop using Macintosh computers and the same software that we are using in our Lab to show participants how we are helping our students with their writing problems. We are hoping that Apple Computer, Inc. will supply the computer equipment we'll need.

Richard Peirce

This past Fall our Headmaster, Richard Peirce, passed away after a long illness. Richard Peirce hired me to put this Project in place, giving it one of the bigger budgets on campus, because he felt that what we were trying to do would work and would help Forman's students. Richard only used the Macintosh a few times, but he saw enough potential in the machine and trusted me enough to go ahead with what was at the time a rather expensive experiment. Richard never saw the first issue of this newsletter, but he undoubtedly would have approved of our efforts. Being dyslexic himself, he had tremendous empathy for people with language disabilities, and he knew that given the right instruction and tools, these people could do tremendous things. His own life is a testament to that: he contributed tremendously to the growth of The Forman School both in stature and in spirit. We miss Richard, and we're grateful for the opportunity he provided for us to come to Forman and start this Project.

An Interesting Letter

We've gotten a lot of mail in response to the first issue of this newsletter, all of it extremely positive and complimentary. One letter in particular caught our attention since it re-affirms some of our underlying assumptions about the use of computers in schools and carry-over from computer use in writing. The letter was from a teacher at Montclair High School in New Jersey named Shirla Matthews Edwards. Here is an excerpt:

"A high school senior, fabulous athlete, with profound dysgraphia so that just writing 2 or 3 lines was excruciating, began using the word processor for his English essays. (His English teacher loved football so was easy to convince to let him have extra time to turn them in until he got used to the process.) He discovered he did have things to say and was able to say them. Lots of little essays. An end-of-year assignment for me was to do a 5 paragraph essay, but when he came in to do it, all the computers were full and I suggested he come back later. 'No,' he said, 'I'll just write it by hand.' I tried to talk him out of that because I thought that the remarkable improvement in his writing was dependent on the machine. Not so. He sat down and wrote a beautiful, long essay, well organized, grammar, spelling, etc. acceptable, and in new, completely changed handwriting! The same thing happened with another student (who said he hated computers and that's why he wrote the essay by hand.) ...I'd be tempted to do some research on this. What happened? Was it increased self-confidence, getting over the stultifying effect of errors, released expression and creativity and/or some organic change???

"Our school system and especially the Special Education Department really doesn't understand the potentialities of freely accessible computers for all students and especially ones with dyslexia and other learning problems. For example, the Business Department just got a whole room full of Macs and they sit there unused much of the time, and other times are used for typing classes."

Rest assured that we are doing research on this and related areas. Not only have we pre-tested all of the students in our Project (and we'll post-test them in June), but we have written comments from all of their teachers for the entire year that we will be able to look at to track improvment.

We enjoy your letters and your observations. Please keep sending them.

Recent Developments at Apple

Richard Wanderman

AppleWorld

On March 2, Apple Computer, Inc. held its annual AppleWorld conference in Los Angeles, California. This particular AppleWorld was quite special since Apple was celebrating its tenth birthday and was unveiling two significant new computers, a new file server system for Macintoshes, and a number of new peripheral devices for the new machines as well as older machines.

AppleShare

AppleShare is a significant new file server. AppleShare allows users of an AppleTalk network to dedicate one Macintosh Plus and a hard disk to act as a file server for the rest of the network. In schools, an AppleShare network might be used administratively to share information, and in classrooms to give students access to software without giving them the opportunity to pirate it (see "Software Piracy" elsewhere in this issue). Apple is promoting AppleShare as a *document* server as opposed to an *application* server because at this point there aren't many Macintosh programs that have the ability to be used by more than one person at a time (multi-launch capability). This isn't to say that you couldn't give each person on the network a folder with software in it, but this kind of duplication would fill the hard disk too rapidly and slow the network's operation significantly. Even as a document server, AppleShare is an excellent tool. More than an electronic bulletin board, this type of "work group" facilitator allows many people to contribute to and share access to a large body of information.

We are considering the use of AppleShare at Forman and will be writing about our research in future issues.

Macintosh SE

On the outside, the Macintosh SE (System Expandable) looks much like the Macintoshes we are using now, with some minor cosmetic changes. On the inside, the entire machine is changed; these changes make it impossible to upgrade current Macintoshes to the SE. As far as school classrooms are concerned, the SE doesn't seem to be a significant machine. It might possibly have administrative uses that the Macintosh Plus can't handle.

Macintosh II

This is a significant machine, but not for K-12 classrooms. This machine's significance is in university, engineering and large business environments. Looking nothing like a Macintosh, this machine is called (and rightly so), a super-microcomputer. In a box about the size of an IBM PC AT, Apple has packed about as much power as a $100,000 dedicated engineering workstation (at less than one tenth the price). This machine has enough raw computing power to do amazing graphics, simulations, and things that we haven't even imagined yet. It will boost Apple's popularity and give Apple more credibility in the business world. How this will filter down to us in the classroom is hard to say.

Old Macintoshes

Apple will still manufacture and support the Macintosh 512K *enhanced* and the Macintosh Plus. For the time being the prices of these machines will stay the same.

Peripherals

Apple also released new hard disks, tape backups and other enhancement products for all of their machines.

An Exciting Year Ahead

There were many other companies showing new products for the Macintosh line (and the Apple II line) of computers at AppleWorld, and the next year should be an exciting one as Macintosh products continue to mature.

Acta Update

Tim Shaw

Acta, the outline processor from Symmetry Corporation reviewed in issue #1 of *The Monitor*, is now even better. Version 1.2 incorporates several new features that make Acta even more versatile. Here are only some of the new features which I find impressive:

Quotation Marks and Paste Get Smart

Something I really like. Acta automatically (and don’t ask me how) will use smart quotation marks (‘’ or “”) when you use the '/" key! It even inserts ’ when you need an apostrophe. Also, data can now be imported from other programs, including databases or spreadsheets, by copying into the clipboard and pasting from there into Acta. Acta will read each carriage return as the start of a new topic.

Options in Saving

Now the Save As... command presents you with some new choices. You can choose to have the topics labeled with bullets and edit those bullets. Also, if you choose to save as a MacWrite file, you can choose a “no ruler” option. Formerly, when Acta saved as a MacWrite document it created a new ruler for each topic. Later editing in MacWrite was hampered by the need to eliminate the excess rulers.

Printing

The most exciting addition to Acta must be printing capability. Page Setup and Print choices have been added to the Acta menu (which scrolls with the cursor now because the menu is too long for the screen). You can print the entire document, or only the selected topic, or you can print only those topics that show (and not the information collapsed in the topics). You can even print with a line skipped between each topic for easy reading. I find one disappointment with the print capability: although you can now print the triangles that Acta uses to mark topics, they only print as solid triangles; topics containing information not being printed should display hollow triangles.

Better and Better

The printing feature makes Acta almost a stand-alone word processor. (One thing it lacks is the ability to make style changes to a single word.) I am excited that my students can now print their outlines immediately rather than have to copy and paste into MacWrite. Using Acta will be even more of a breeze than it has been in the lab—for everyone, not just learning disabled students.

Spelling Checkers

Richard Wanderman

Things are changing rapidly in the world of Macintosh spelling checkers and writing analyzers. So fast, in fact, that our published intention to do a review of available spelling checkers in this issue will have to be retracted—we just haven't had a chance to use all of the new products in our Lab with our students. Yes, we can do a review of all of the spelling checkers from a regular computer user's viewpoint, but that isn't what this newsletter is about. You can read reviews like those in any of the Macintosh magazines. We would much prefer to fill in where other publications leave off and review things from the viewpoint of the dyslexic computer user.

At this point, in our Lab we are de-emphasizing spelling checkers for general Lab use. This isn't because they are ineffective—they are very effective—but because we feel that to start our students using one and then switch to another mid-stream would be confusing and disruptive. Yes, rapid change is the norm in the computer world, but since our Lab is a microcosm where we can filter what comes in, we feel that we would like more stability in this area before we start using spelling checkers routinely.

Spellswell

We think a program called SpellsWell is the best stand-alone spelling checker. It is relatively easy to use, checks homonyms, has an intelligent way of adding words (in all of their varying forms) to the dictionary, is not copy protected, and is inexpensive. The biggest drawback of Spellswell is that you must quit your word processor to use it (this is what we mean by "stand-alone"). This means that you can't edit your writing at the same time you are checking for spelling problems, something that other spelling checkers allow and we feel is important for the dyslexic writer. On the other hand, Spellswell does an excellent job of flagging homonyms and showing each confusing word in a sample context to aid in making a choice. Our students who use Spellswell like it but complain about the stand-alone problem mentioned above.

Thunder

Thunder is a desk accessory spelling checker, which means that it is accessible from a variety of programs. It is relatively fast and somewhat intelligent when asked to guess the spelling of a word. We haven't used it extensively, but from the little we have used it we've found its operation too gimmicky—its control window has too many buttons and too many options.

WriteNow

WriteNow is not a spelling checker; it is a full-featured word processor with a built in spelling checker. We like it because its spelling checker is fast and has an excellent and intelligent guess feature. The spelling checker is always available and its control window is very simple. There aren't as many options as Thunder, but WriteNow makes up for this with extreme ease of use. Unfortunately, WriteNow is a new product and like many new products has some bugs and some design problems which we are hoping will be worked out in the near future. None of these problems are severe enough to prevent you from buying it, but be warned that they exist. I am using WriteNow right now to write this copy.

Other Programs

There are many other spelling checkers and writing analyzers available for the Macintosh, including MacProof, MacGas, MacLightning and others. But as stated above, we don't want to write about them until we have worked with them in our Lab with our students. We hope to have more on these types of programs in a future issue.

Update on Aron

Karen Craig

In the last issue I wrote a piece called "The Key?" about Aron, a dyslexic student who spends most of his Language Training class time in the Macintosh Lab. If you were to talk to Aron about how he has progressed, he would just roll his eyes and say, "It's not that big a deal!" But I believe the progress Aron has made in spelling and writing is a big deal. His attitude sometimes gets in the way, but this is no surprise since there have been so many frustrating years for Aron up to this point. At first the excitement and growth was unbelievable; we all know that excitement has a lot to do with learning. Aron has progressed rapidly in his ability to use the Macintosh, and his LT work has progressed well, although we have, at times, reached plateaus. I am pleased with his writing and spelling progress; however, the carry-over to reading from the written page has not been as noticeable. Aron still panics when he sees the written page, but I feel his reading will improve; he and I just have to be patient. Patience isn't always easy, even for someone who has had to learn exceptional patience through the years because of dyslexia. Perhaps, in his own way, Aron expects that the Macintosh will now make all academic learning easy. I believe it certainly makes a big difference, but Aron has to remember that learning is always a struggle. Mistakes determine needs, and mistakes involve struggle. The Macintosh is a tool, but the tool does not do the work, it simply aids in the learning process.

Carry-Over

Shirla Edwards, who teaches at Montclair High School in New Jersey, recently sent a letter to Richard Wanderman (see "Recent Developments at Forman" in this issue). In the letter she, too, suggested that some of her students' successful academic performance in other subject areas may very well occur because of students' successful experiences using computers as tools to aid in the learning process. We hope that the information we are gathering and research we are doing in the Forman Macintosh Lab will supply us with the necessary criteria to support this hypothesis.

Process Approach

During the rest of the school year, Aron and I will continue with the *process approach* to writing using the Macintosh, but we will focus on the reading (decoding) end of language arts: first reading on the computer, and then transferring that reading to the written page. This will mean spending some of his class time away from the Macintosh. I believe that the post-tests at the end of the year will reveal tremendous growth in Aron and affirm my belief that the Macintosh is the key to that growth. I believe this computer is what has turned Aron on to learning. He even succeeded in making the academic honor roll at Forman last term. If the Macintosh computer is the key for this student, how many others is it the key for? I will give another update on Aron's progress in the next issue of *The Monitor*.

Software Piracy in Secondary Schools

Tim Shaw

> "The real significance of crime is in its being a breach of faith with the community of mankind."
> *-Joseph Conrad*

Any group that wishes to promote the responsible use of computers will inevitably need to address the subject of software piracy, the illicit duplication or distribution of software. Whether or not the legal part of the debate will ever be enforceable, there are certainly ethical considerations which must be taken into account, especially in an academic environment in which educators are at least partially responsible for helping young people to develop a sense of ethics.

I am not sure, however, if I myself would hesitate to use whatever software came to hand. Frankly, that admission scares me, because I have no desire to be exposed as a hypocrite—the worst sin an adult can commit in an adolescent's eyes. I will not, however, be so naive as to assume that we adults are perfectly scrupulous about piracy ourselves. My concern at the moment is less for the adults who pirate—at least adults can understand the ethical argument—than for young people whose sense of ethics is not yet developed.

Handling Real Situations at Forman

At The Forman School, with the profusion of Macintoshes on campus, both in the Lab and student-owned, we have already faced situations involving purchase and distribution of software that were uncomfortable, to say the least. We have found it necessary to come down hard and fast when we find evidence of piracy—either actual or potential. Here is a case that cropped up recently: Adam was sent WriteNow by his father; several students heard it had a good spelling checker; Bill offered Adam $5 and a blank disk to make him a copy of the program. This took place in the dormitory where I am a houseparent. I warned them about the wrongness of their actions, not only on a legal level (they correctly deduced that I would not "call the cops" on them), but also on a scholastic level: Forman extends its policy on academic honesty to software piracy. They know that I can and will monitor their computer use: all I have to do is wander by during Study Hall or whenever I hear them composing on their Macintoshes. (The postscript: within a week, Bill bought WriteNow for himself.)

How does one stop piracy among students? The best way seems to be a point-of-error method: spot each instance as it happens wherever possible and correct it immediately. This does not solve the problem, however, for obvious reasons (teachers may be omniscient, but we are neither omnipotent nor omnipresent). There are two areas to be considered on the subject of piracy: education and opportunity.

Education and Opportunity

Students must be educated about the illegal and unethical side of piracy. We all understand what makes piracy wrong, and below are specific instances where I have tried to educate students. More than that, however, students must not be put into a situation where they are tempted by the opportunity to pirate software. It is dangerous to tell a student, "Here's MacDraw; it's a terrific program and I think you can go far with it; just don't give it to anyone, because you're not supposed to have it." This confuses him when you are trying to teach him responsibility and ethics. He cannot perceive the dividing line between what you do and what you tell him not to do—if, indeed, there is one.

There are times when I would like to give a program to a student whom I know would benefit from it but would never share it. I would be fooling myself if I thought that this action on my part constituted responsible handling of the software. Even if my "temporary loan" of the software to him were appropriate, I could never guarantee that the program would go no farther. Even if I trusted him not to succumb to peer pressure and give someone a copy, I cannot assume that there is any place on the Forman campus outside of an adult's apartment where a disk is safe from duplication.

Unfortunately, we ourselves show them how easy it is to pirate. For instance, teaching my classes to back up their storage disks by copying with the Finder elicited a comment from one of them about how easy it was. I resorted to the stage magician's standard technique of misdirection, and asked if they noticed how copying a simple *file* went so quickly and easily. One student who had acquired a Mac a few months earlier replied, "Yeah, there are some programs that don't copy easily." Rather than pursue the assumption that he had obviously attempted some copying, I responded to the remark with a brief lecture on the programmer's desire to copy-protect a program that he has put time and effort into, and told them about the various protection schemes that will produce defective copies of the program in question. They looked crestfallen when they realized that it would not be easy to get any program they wanted. This seemed to defuse interest in copying for the moment. Luckily, no one thought to ask if *all* programs were copy-protected.

The Uphill Battle

Piracy is indefensible. Sadly, it is also difficult to explain to adolescents (or anyone) exactly why it is wrong. The threat against copying movies or TV shows with your home VCR stops no one from making bootleg tapes. How do you prevent teenagers from making cassette copies of their friends' record albums or cassettes? Modern personal stereo equipment with dual cassette decks encourages piracy. Would I go too far if I say that, as usual, teachers are put in the unfair role of moral combatants against the rest of society? Perhaps. At Forman, we are keenly aware of our status as role-models who are supposed to be above reproach. We cannot condone piracy, just as we cannot condone plagiarism.

As I mentioned above, The Forman School recognizes that violation of software copyrights is a serious infraction of the school's honor code. When students purchasing a Macintosh system through our local Apple dealer ask about software, we tell them to buy word-processing and graphics software and any other programs they want to use on their machines. We stress that they do not own the software that we provide in the Lab, and that they must buy their own copies for home use. Students in the Computer-aided Writing Project are encouraged to store their disks in the Lab. This guarantees that the disks are kept safe and clean and are never forgotten. Students with their own Macs, however, will often take the disks back to their dorm to do homework. Not to allow this would seem contrary to the spirit of the Project.

No Quick and Easy Solutions

I have tried to explain to students the ethical problem involved in pirating someone's work. I have tried to impress upon them the convenience of buying a program and receiving both documentation and updates of future versions. They are more than willing, however, to take the risks and try to figure out a program themselves, especially if the program is a game. We are fortunate that Copy II Mac (a program for copying software) has not been discovered by our students. The last thing the Computer-aided Writing Project wants is to churn out a generation of adolescents who have been raised on the latest methods of getting past copy-protection or who have had illegal access to almost any program their hearts desired.

With a file server—which enables individual computers on a network to function like terminals accessing programs from a mainframe—software can be kept under tight rein. Lacking the funds necessary to devote a hard disk and computer to the file server, however, many Labs simply cannot afford to eliminate pirating opportunities.

Education about piracy, however, costs nothing. In any setting, academic or other, a firm policy must be stated, and breaches of that policy must be dealt with swiftly and firmly. Such a policy must pertain to all persons involved in computer programs—especially the adults whose actions are observed and remembered by students. We must not let eyepatches become blindfolds to the severity of the ethics of piracy.

A Different Type of Computer Camp

This summer, The Forman School is sponsoring a Macintosh computer camp for high school-age students. What makes this camp unusual is that it will introduce computer novices to the use of the Macintosh computer to do school-related work. No previous computer knowledge or experience is necessary to participate in and enjoy this computer camp. The two intensive two-week sessions will introduce computer-aided writing and computer-aided design using the Macintosh computer and a variety of powerful software. The camp will also provide afternoon sports activities each day, evening cultural activities, and field trips. The Forman School is offering 1/2 academic credit for this computer camp experience.

When

Session 1: Sunday, June 28 - Friday, July 10
Session 2: Sunday, July 12 - Friday, July 24

For More Information Contact

Richard Wanderman, Director
Computer-aided Writing Project
The Forman School
Litchfield, CT 06759
203/567-9048
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Faculty Notes

Emmy Pellico

Faculty Notes is a weekly newsletter for The Forman School faculty. It is produced with a Macintosh computer and LaserWriter printer and then photocopied and distributed to the faculty each Monday. *Faculty Notes* serves as a collective message center for the wide variety of information that once cluttered faculty mailboxes on several separate sheets of paper.

The Process

Putting together the *Faculty Notes* is a group effort headed by editor Roxanne Hewitt, the Director of Professional Development at Forman. Throughout the week, various articles are written by the faculty and placed in Roxanne's or my mailbox. The deadline for submissions is 2:30 p.m. on Thursday. The articles are notes and/or reminders from the Academic, Admissions, and Business Offices, and various departments. Information includes special events, department meetings, schedule changes, upcoming conferences, student disciplinary information, minutes from meetings, etc. Most faculty submit articles on paper, but as more of them become comfortable with the Macintosh computer they are putting articles on two disks stored in the Macintosh Lab.

Most of the typing is done by Roxanne on her own Macintosh. She receives help from faculty members Paula Wiley, Diane Hein and Karen Craig. Occasionally others help out with this laborious job. Last minute articles are added on Thursday afternoons in the Macintosh Lab on or about the 2:30 p.m. deadline. Later Thursday, Roxanne takes all of the articles on disk and places them into one Folder. Roxanne organizes, determines order, and edits the articles before she hands them over to Sherry Blanchette for proofreading. Sherry, who prefers to proofread on-screen, looks for spelling and typographical errors. Finally, all the articles are given to me to put into PageMaker, an electronic page layout program. On Friday, I electronically cut and paste the bulk of the articles into one MacWrite file. Placing one MacWrite file in PageMaker is much quicker and easier than placing many individual files. On Saturday I do layout in PageMaker.

What is nice about doing the newsletter on the computer is that, because certain things are constant from week to week, I can save the same file and make changes without re-designing or re-writing the standard information for the next week.

After placing all the articles in PageMaker, I print a draft. From the draft I determine where graphics can be placed or where final changes need to be made. The final laser-printed copy is photocopied, stapled and put into faculty mail boxes on Saturday or Sunday afternoon.

Then, as early as Monday we may start receiving articles for the next issue.

It Is Working

The success of *Faculty Notes* is the result of hard work and cooperation. Sharing the work has enabled us to make a large job manageable and fun. Over time, the process has become streamlined. The feedback we get from other faculty lets us know that *Faculty Notes* is doing exactly what Roxanne intended it to do: make information more manageable.

From the Rest of Us

A column, by various members of the Forman community, devoted to the use of the Macintosh outside of the Computer-aided Writing Project.

Roxanne Hewitt

Early Computer Fears

I am one of those people who were never going to use a computer. All the tacky negative cliches about computers used to roll off my tongue at the drop of a hat. My fear of computers stemmed from a horrible programming course I took as a sophomore in college. I would sit in the computer lab late at night under the glare of lights that hum, writing programs and punching little square holes into rectangular cards covered with numbers. I'd write sensible-looking columns of number equations on paper, type them onto the cards, wait with breathless anticipation and undying hope, and then have the cards come shooting back at me out of the computer. Humiliated and frustrated, I reasoned that the problem was the computer, not me. It would be 14 years before I put my hands on a computer again.

Then came the small, manageable personal computer. My sister got one (an Apple IIc) and her little boy learned to use it with embarrassing ease. My mother took a personal computer course at the local high school. My colleagues and friends were getting computers. I was bombarded by the media, seeing the machines on TV and in magazine ads. I finally used one, and the one I used was a Macintosh.

Discovering the Macintosh

My first experience with a Macintosh was a good one. I was so surprised! I used my best friend's to do comments. At Forman, every student gets academic, advisee, sport and houseparent comments sent home along with his grades at the end of each term. The quadruplicate form on which the comments are typed lends itself to monstrous torture, suffering, and heartbreak on the part of the poor teacher using it. My friend sat me down one afternoon and taught me the rudiments of MacWrite. The chore that had once taken a week of painful procrastination and ten hours of frustrating writing, typing, and retyping, took only four hours. The seeds were sown.

"...I felt Benjamin Franklin on my shoulder saying 'Well done.'"

Once I had learned what MacWrite and MacPaint could do, and once I felt comfortable with the machine, all sorts of projects came to mind. This past summer, another friend (the first person to own a Macintosh on campus, Tim Shaw) and I put out a summer school newspaper, *The Summer Sun*. Students gave us articles that they had handwritten, and Tim and I typed them with MacWrite. Finally, we cut out the printed articles and pasted them in columns on 8 1/2 by 11 inch sheets of paper and photocopied them. When the first issue was photocopied and handed out, I felt Benjamin Franklin on my shoulder saying "Well done." I also felt the delight of the kids who saw their articles in print, and I heard them asking if they could write more. Can you imagine? A dyslexic student running up saying, "Hey, can I write an article for *The Summer Sun*?"

The Summer Sun spawned *Faculty Notes*, a weekly Forman faculty newsletter. By this time, Richard Wanderman and Emmy Pellico had arrived and set up our Macintosh Lab. Emmy, a graphic artist, Macintosh enthusiast and teacher, was enlisted to help me in the publication of *Faculty Notes*. Although nerve-racking at first, publication of *Faculty Notes* is now (after our 20th issue) relatively smooth. Our only hitch is when the photocopier breaks down.

"...I was learning what a System Folder is and what the Finder is...."

About a month after I started using the Macintosh regularly, I knew that I had to have my own. I was using one all the time. I had students in the Computer-aided Writing Project, I was learning what a System Folder is and what the Finder is, I bought a disk and a nifty little case to hold it in. I loved the keyboard and my typing was improving. The clincher came when Forman was evaluated by the New England Association of Schools and Colleges this fall. I am the Director of Professional Development and so have a budget to use for teachers' professional growth. In order to keep track of the money I give out to faculty for courses and conferences and workshops, I keep their requests in writing and copies of receipts on file in the file cabinet in my office. You can imagine my panic when one of the NEASC evaluators asked for a breakdown of my budget for the past two years. She wanted to know who went where how many times and for how much money and she wanted the list in two hours. Armed with two fat files of records I flew down to the Lab, booted up a Macintosh, and although I didn't have the whole list, I had enough of a list to give the evaluator what she wanted to see. After that experience, I was hooked. A few days later, I ordered my own Macintosh.

"If I get an idea, I open up Acta, and out my idea flows."

I use my Macintosh for lots of things. I type letters to my nearly blind grandmother, enlarging the typeface so that she can read them on her own. It does wonders for her self-esteem not to have to rely on someone else to read them to her. If I get an idea, I open up Acta, and out my idea flows. When little kids come over to visit, MacPaint allows the adults to converse in peace. Once a year I organize a fund-raising dinner here at school. My Macintosh makes the task of knowing who is sitting where, with whom, and eating what a pleasure.

I am a houseparent here. There are 23 adolescent girls living under one roof with me. Judy Kistler, the houseparent upstairs and another of the "MacAttacked," and I use our Macintoshes to design eye-catching memos, lists of house jobs and girls and activities. The girls rarely miss the content of a "MacMemo." They love the drawings MacDraw and MacPaint allow us to create. I have often heard one girl say to another, "Oh, wow! Look at this one! They've been at it again."

"My handwriting is getting worse because I type everything now."

All this sounds too good to be true. And for the most part it is. There are problems for this Macintosh user. My handwriting is getting worse because I type everything now. I didn't buy an IRA this year because I used the money for my Macintosh. My parents want me to write them more "MacLetters." I stay up too late at night working on my Macintosh. My car will soon wear its first bumper sticker: "I'd rather be driving my Macintosh." And the thought of writing a Ph.D. dissertation is no longer intimidating. Am I complaining? No way. Thank you Apple.

Contributors

Richard Wanderman has an MFA in Fine and Applied Arts from the University of Oregon, Eugene. He has taught ceramics, design and computer-aided design at the University of Oregon for the past four years. He has also written, lectured and done workshops about the connection between personal computers and dyslexia. He is currently directing the Computer-aided Writing Project at The Forman School.

Tim Shaw received a BA in English and Classics from St. John Fisher College in Rochester, NY, and an MA in Medieval Studies from The University of Connecticut. As a Graduate Student Teacher at UConn, he received the 1984 Award for Academic Excellence. He has taught English Literature at Forman since May, 1984. He currently teaches Composition on the Macintosh at Forman.

Emmy Pellico has a BS in Graphic Design from the University of Oregon, Eugene. She has produced a variety of publications for the University of Oregon and other Eugene businesses with the Macintosh and LaserWriter printer. She is currently assisting in the running of the Forman Macintosh Lab, teaching a variety of courses and producing some of Forman's publications in the lab with the Macintosh and LaserWriter printer.

Dr. Laurie Fais received her PhD in Linguistics from Indiana University in 1981. In 1982, Dr. Fais came to The Forman School to teach Language Training and act as Director of Professional Development. She is currently the head of the Language Training Department and is involved with the Forman Computer-aided Writing Project. Dr. Fais helped to write the Language Training Department curriculum and has presented papers on teaching linguistics to dyslexic adolescents and on the LT curriculum.

Karen Craig received her BA from Muskingum College in New Concord, Ohio. Since then, she has taught school in Pennsylvania and New Hampshire, where she was involved in curriculum development in the area of the process approach to the teaching of writing. She is a Language Training teacher at The Forman School and is involved with the Forman Computer-aided Writing Project.

Roxanne Hewitt received her BA from Elmira College in Elmira, New York, and her MS from the State University of New York at Albany. A teacher in the Language Training Department who participates in the Computer-aided Writing Project, she is also the Director of Professional Development and a houseparent, and she is the Director of the New York City Summer Scholarship Program for The Forman Summer School.

Products Mentioned

Retail prices are in parentheses. Products can sometimes be purchased through mail-order houses for less.

Macintosh 512K *enhanced* ($1699.), **Macintosh Plus** ($2199.), **LaserWriter** ($4995.), **MacWrite** ($125.), **MacDraw** ($195.), **MacTerminal** ($99.). Apple Computer, Inc. 20525 Mariani Ave., Cupertino, California 95014. 408/996-1010.
SuperPaint ($99.), **World Builder** ($79.95), **Enchanted Scepters** ($39.95), Silicon Beach Software, 9580 Black Mountain Rd., P.O. Box 261430, San Diego, California 92126. 619/695-6956.
Acta ($59.95), Symmetry Corporation, 761 East University Dr., Mesa, Arizona 85203. 602/844-2199.
PageMaker ($495.), Aldus, 411 First Avenue South, Seattle, Washington 98104.
Microphone ($74.95), Software Ventures, 2907 Claremont Ave., Berkeley, California 94705
Transylvania ($39.95), Penguin Software, P.O. Box 311, 830 4th Avenue, Geneva, Illinois 60134. 312/232-1984.
Real Life ($29.95), Relational Systems Corporation, 22809 Shagbark, Birmingham, Michigan 48010. 313/645-5090.
Racter ($39.95), Mindscape, Inc., 3444 Dundee Road, Northbrook, Illinois 60062.
Copy II Mac ($), Central Point Software, 9700 SW Capitol Hwy., Portland, Oregon 97219.
WriteNow ($175.), T/Maker, 1973 Landings Dr., Mountain View, California 94043.
Spellswell ($59.95), Greene, Johnson, 15 Via Chualar, Monterey, California, 93940.
Thunder ($49.95), Batteries Included, 30 Mural St., Richmond Hill, Ont., Canada L4B1B5.
MacProof ($195.), ALP Systems, 190 West 800 North, Provo, Utah 84604.
MacGas ($99.), EnterSet, 410 Townsend St., San Francisco, California 94107.
MacLightning ($99.95), Target Sofware, 14206 SW 136th St., Miami, Florida 33186.

Glossary

A list of computer-oriented and education-oriented terms which are either used this issue or will be used in future issues.

Dyslexia A neurological difference that causes difficulty with reading and writing. Dyslexia is a developmental disability; it can be affected by environmental factors.

Dysgraphia A neurological difference that causes difficulty with handwriting and other types of symbol making. Usually associated with dyslexia.

Kinesthetic Referring to the sensation of bodily movement. In the field of learning disabilities, used to denote a learning channel separate from visual and auditory. Kinesthetic learners learn best by literally "going through the motions."

Multi-sensory Processing information through more than one sense or presenting information to more than one sense. Multi-sensory feedback is a feedback system where many senses are involved.

Interactive A program or experience that allows or requires loops of immediate feedback or responses.

Encoding Literally, to put into code. In the field of learning disabilities, used to denote the act of spelling words.

Decoding Literally, to turn from code into "plain" language. In the field of learning disabilities, used to denote the act of reading, or pronouncing words.

Point-of-error instruction Instruction determined by the nature of errors made by a student in the course of previous work.

Process Approach to Writing Focus on and use of the entire writing process, rather than the resulting product, usually starting with unstructured writing and later moving toward structure, mechanics, and spelling correction.

Experiential learning Hands-on learning.

Fantasy role-playing (FRP) (Usually) games that simulate fictional worlds; the player assumes the role of an inhabitant of the world and interacts with different situations.

MacWrite A Macintosh writing (word processing) program.

Acta A Macintosh outlining program.

MacPaint A Macintosh drawing program.

MacDraw A Macintosh drafting program.

SuperPaint A Macintosh drawing and drafting program

(Operating) System A collection of programs that operate a computer. Application programs need system programs to run.

Finder A Macintosh system program that manages files and directories of files. The Finder is a visual shell for the Macintosh operating system. When you put a startup disk in the Macintosh, the program that automatically starts up is the Finder.

Folder A container for files. A way of visually organizing information. A folder allows for the grouping of similar files and folders. One uses folders when in the Finder and when opening and saving files from any Macintosh program running under the Hierarchical File System.

System The System file on a Macintosh disk contains the operating system of the computer. It also contains resources that all programs on that disk share. Some of these are fonts and desk accessories.

Hierarchical File System (HFS) The folder system that the Macintosh operating system uses to store files in a hierarchical fashion.

Flat File System A non-hierarchical file system where there is only one level. For example, a file cabinet drawer full of papers with no file folders.

Mouse A small box-like attachment that, when moved on a flat surface, makes a cursor move on a computer screen. It is a powerful replacement for cursor keys on a keyboard for most applications.

Icon A symbol. The MacWrite program symbol and the Trash can are icons. With the View menu you can arrange your files by Name instead of by Icon.

File Information stored as a unit on a disk. Programs as well as the work done with them are files on a disk. Macintosh files are represented by icons or names in disk windows.

Enhanced The term Apple uses to label 512K Macintoshes which contain the new Hierarchical File System in their ROM chips and have a double-sided disk drive. All 512K Macintoshes being produced now are enhanced. Older 512K Macintoshes can be upgraded to enhanced by Apple dealers.

Hard Disk A high-speed, high-capacity, fixed disk. A hard disk might hold 20 megabytes (billion bytes).

Kilobyte 1024 bytes (sometimes rounded off to 1000). Sometimes called a "K."

Megabyte 1024 kilobytes (sometimes rounded off to 1,000,000). Sometimes called a "meg."

Gigabyte 1024 megabytes (sometimes rounded off to 1,000,000,000). Never called a "gig."

Desk Accessory Small programs that are accessible while a larger program is running. A DA allows the user to access two programs at once.

Memory A component of a computer that holds information for the microprocessor to work on, some permanently, some temporarily. Memory is usually made up of arrays of chips. Strictly speaking, disk storage is memory; most people do not include disk storage when talking about computer memory.

RAM Random Access Memory. A RAM is a type of memory chip. The Macintosh has either 128K, 512K, 1024K or more RAM in it. There are banks of RAM chips soldered to the main circuit board inside the machine. RAM holds programs (MacWrite) and data (your writing) so that the microprocessor can work with them. It's volatile, which means that it only works when it has power (electricity). Take away power and the information in RAM chips disappears.

ROM Read Only Memory. A type of RAM chip that holds essential information and cannot be used by you to store new information. Parts of the operating system of the Macintosh are stored on its ROM chips. The Macintosh has either 64K or 128K of ROM. ROM is sometimes called Firmware because it's not quite hardware and not quite software, but a combination of both.

Network Sometimes called "local area network" or LAN. A group of small computers linked together so that they can share printers and other devices.

AppleTalk A LAN that connects Macintoshes to each other and to shared peripheral devices, such as printers.

Mainframe A large, powerful computer which usually looks like a group of refrigerator-sized boxes hooked together. This type of computer allows many people to use it at the same time. There might be 20 or more terminals attached to the mainframe. A Terminal is a monitor and a keyboard. Mainframes have tremendous power and storage capacity and operate at very high speed. Large corporations, universities and government organizations use mainframes to store and work with large amounts of information.

Microcomputer A small, self-contained computer. Sometimes called a personal computer (PC). The Macintosh, IBM PC, Apple II and Amiga are microcomputers.

BBS An electronic bulletin board system. A computer running bulletin board software along with a modem hooked up to telephone lines that allows others to call and access the bulletin board computer.

Modem A device that converts digital signals into sound (and sound into digital signals) that can be transmitted over telephone lines. A modem allows computers to communicate over telephone lines. The word "modem" is a contraction of **mod**ulator and **dem**odulator.

Null-Modem A cable which allows two computers to communicate with each other without modems and telephone lines.

AppleLink A network with a BBS in Detroit as its hub. Also, a telecommunications program enabling use of the network.

E-Mail Electronic mail. Paperless letter writing. Usually sent to a central computer (bulletin board) where the receiver also calls to pick it up.

Telecommunications Communication over telephone lines, usually via computer, telecommunications software and modem.

Baud, baud rate The rate of transmission of computer data over telephone lines measured approximately in bits per second.

File server A set-up (hardware and software) that allows several computer users working on computers configured in a local area network to have access to the same files.

AppleShare A file server produced by Apple Computer, Inc. AppleShare is software which can run on hard disks produced by Apple or other manufacturers.

Multi-launch A program's capacity to be accessed by several users simultaneously via a file server. To date, only a limited number of Macintosh programs have multi-launch capacity.

Stand-alone Describes a program that is a self-contained system. In the context of spelling checkers, a program that does not operate concurrently with another program.

AppleWorld An annual conference sponsored by Apple Computer, Inc.

Software Piracy The illegal reproduction and/or distribution of software.

Public Domain Software Free software distributed publicly through computer users groups and over BBSs.

MacTerminal A telecommunications program for the Macintosh.

Microphone A telecommunications program for the Macintosh.

Local Echo A telecommunications term. The display of typed text on the sender's computer screen as verification of a completed transmission.

Command-Line Driven Interaction with a computer that is primarily the typing of commands on the computer's keyboard. A command-line is a line of commands.

MS-DOS Microsoft Disk Operating System. The file system of the IBM PC family of computers and its clones. A command-line driven file system.

The Macintosh Lab Monitor

A quarterly publication documenting the Computer-aided Writing Project at The Forman School

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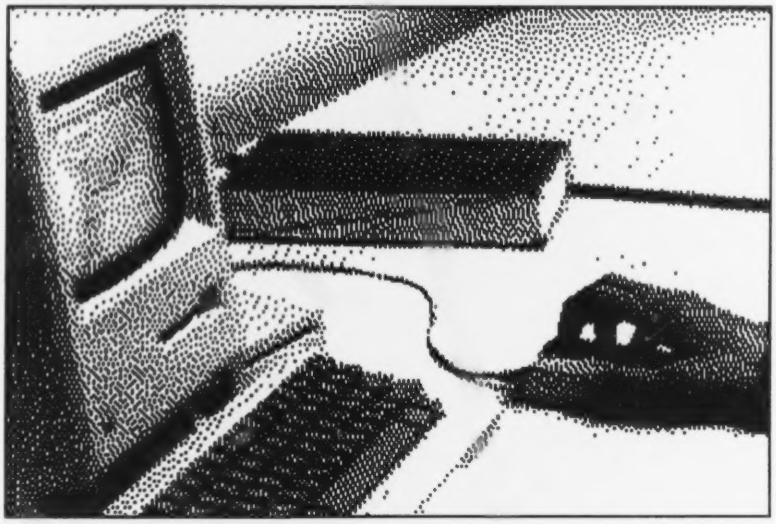

#3
Spring, 1987

The Macintosh Lab Monitor, #3. Spring, 1987. © 1987
Editors: Richard Wanderman and Tim Shaw.
Copy Editor: Roxanne Hewitt.
Writers: Richard Wanderman, Tim Shaw, Laurie Fais, Karen Craig, Emmy Pellico, Steve Carberry and Aron Sheehan.
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For more information contact: Richard Wanderman, Director, Computer-aided Writing Project, The Forman School, Litchfield, CT 06759. Phone: 203/567-9048. AppleLink: K0564.

Project Overview

Richard Wanderman

The Computer-aided Writing Project at The Forman School has shown an amazing amount of growth and progress this past year. Frankly, I thought we would have had to wait two years to see even less. Most importantly, we've seen growth in students' writing as a direct result of the work they are doing in the Macintosh Lab. The quality and quantity of student writing has grown at a very fast pace. Many students' attitudes about the writing process have matured in direct proportion to the lessening of their frustration with it. We've also seen tremendous enthusiasm for the Macintosh as a personal computer on campus. Many students and faculty are buying Macintoshes as they become excited about using them in the Lab. This is gratifying in that part of our mission here is to try to make computers more accessible to the whole school.

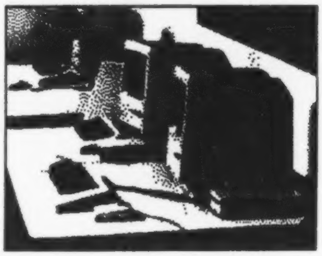
Enthusiastic Administration

As we outlined in the last issue of *The Monitor*, the Forman Macintosh Lab is doubling in size to accommodate our increased course load next year (see "Thinking and Writing" in this issue). In addition to this growth, our administration is becoming increasingly enthusiastic about the use of Macintoshes in offices. A good part of our recent order for Macintoshes from Apple was for administrative machines. Having the same type of computer in offices as well as Labs is a positive thing. We've already run into the situation where students are helping administrators learn how to do what for the students is now routine. This is wonderful to behold.

Research

A large part of The Computer-aided Writing Project is documenting what we are learning in the process of working with computers and dyslexic students. This year and next, Laurie Fais is in charge of designing, administering and assessing a battery of pre- and post-tests that the students participating in the Project take at the beginning and end of the academic year. What is particularly interesting to me is that much of what I have felt in my gut from personal experience and from watching others has been made explicit in the results of these tests. In this issue of *The Monitor*, Laurie explains the testing and the results.

As was the case with issue number one of *The Monitor*, you have given us a very positive response to issue number two. For those of you who may have been wondering how a small, private school like Forman can afford to publish a newsletter like this and distribute it as widely as we are, I want to offer a rationale to help explain our situation.



Model

From the beginning, this past fall, we have treated our Macintosh Lab and Computer-aided Writing Project as experiments; we are looking at ourselves as a model for other schools and individuals interested in the area of computer-aided writing for dyslexic individuals. We want this publication to represent the quality of our commitment to the Macintosh as a revolutionary tool and to our work as teachers and researchers trying to figure out how best to use it with dyslexic students. The computer that we are writing about is the same computer that enables us to publish this newsletter. The members of this Project are committed to using the Macintosh in the classroom and to document what goes on in the classroom with it. We are not only changing the way our students think about writing, computers and personal expression, we are changing the way that we personally think about using computers to aid us in our own personal expression.

Support from Apple

After working in the Apple Special Education booth at the National Convention of the Council for Exceptional Children in Chicago, Alan Brightman, the Head of Special Education at Apple, asked if he might help us publish *The Monitor*, since it is a quality publication aimed at the same people he is interested in communicating with. We have accepted his and Apple's help thankfully, and it will ensure that we continue to publish *The Monitor* at no cost to subscribers. We want to thank Alan Brightman, Robin Coles and Pam Patton from Apple's Cupertino, California Office of Special Education and Robin Fryer from Apple's Marlboro, Massachusetts office for all that they have done to support our Project. It's very nice to feel appreciated.

Post-testing Results and Year-end Observations

Laurie Fais

Prologue

John sat across from me at the table in front of a Macintosh computer. As Head of the Department, I was lucky enough to have one in my office, though I didn't know very much about using it. John is very dysgraphic so I figured using a computer might make it easier for him to write what he wanted to write.

We were working on possessives that day. "Give me a sentence using 'boy' in the possessive." "The boy's bat broke" was his reply. Typical. Even orally, John was in the habit of giving the bare minimum verbal response. "OK, now type it with the computer." John slouched back, one hand in his pocket and began to peck. With the patience born of working with LD adolescents, this one in particular, I waited. And waited. Finally, my curiosity piqued, I stood up and strolled around behind John to see what was taking so long. He had typed "The boy's bat broke when he hit the ninety mile an hour fast ball."

Intrigued but afraid to be hopeful, I gave him another word: "witch." "The witch's brew boiled." "OK, now type that." Another wait. Then on the screen appeared "The witch's brew boiled over and drowned the black cat sitting next to the fire."

Those who work with LD students, or, in fact, any students, with computers often make intuitive claims about the advantageous effects this work has on their abilities to express themselves in writing. Unfortunately, there is currently a lack of "real" research validating these claims. The work that makes up The Forman School Computer-aided Writing Project has been designed to serve as the basis for some educational research that should validate and explain the effects of using the Macintosh on the growth of the writing skills of these students.

The Computer-aided Writing Project

The Computer-aided Writing Project encompasses all of the various contexts in which learning disabled students at The Forman School learn to use the Macintosh computer as a writing tool: the small group classes, Computer-aided Composition, and the one-to-one language skills remediation course, Language Training (LT). In September of 1986, all of the 185 students in the LT program were screened and 48 were selected to go to the Laboratory one day a week during their LT class time, accompanied by their teachers. There they would be taught how to use the Macintosh as a writing tool by the Director of the Lab, Richard Wanderman, or his assistant, Emmy Pellico. Of these students, 27 were selected as participants in the Computer-aided Writing Project research program, to be pre- and post-tested in a number of writing and language skills.

Pre-testing

The students did informal writing samples and were tested on their abilities to judge the relevance of specifics to a given topic, to categorize specifics and topics into coherent groupings/outlines, to order specifics in a logical paragraph order, and to proofread a paragraph with not only grammatical, punctuation and spelling mistakes, but also mistakes of organization and clarity. In addition, the students also took four sections of the Test of Adolescent Language (TOAL), which tested their grammar abilities in the areas of reading, listening, speaking, and writing.

After the pre-testing, the students spent one day a week with their LT teachers and Richard or Emmy working on a variety of tasks. Most learned to use Acta, an outlining program, and became proficient at the process of generating ideas, formulating an outline and producing a written piece of work, either in Acta or in MacWrite. Students learned all the basics of word processing and printing. Some engaged in "conversations" from computer to computer with their teachers (see "Conversational Writing," *The Macintosh Lab Monitor, #2*). Much of the learning was directed toward the accomplishment of a specific piece of work, often work for another class, such as a senior English critical essay, a History research paper or a Science Fair project write-up. Some exercises were just that—generated by the LT teacher for the sake of teaching a student how to use the Macintosh as a writing tool. The teachers kept notes on their observations of how certain approaches seemed to work, what students' reactions were, and what the more subtle effects of using the Macintosh seemed to be.

Post-testing

Students were post-tested in May, covering the same areas as their pre-testing the previous September. In the course of evaluating the results of each of the tests in the battery, certain trends became apparent.

Unrelated Specifics. Students were asked to eliminate from a list of words and sentences those items that did not fit the general category of the list. Students made no improvement in this area; in fact, there may have been a slight downward trend in the post-testing results.

Categorizing/Outlining. Students organized items in a jumbled list, out of the writing context. They showed no change, and in fact may have shown some loss.

Arranging Specifics. Students were asked to arrange lists of sentences into paragraphs. The paragraphs were of differing organizational types: temporal, comparison/contrast, spatial, logical, etc. Markedly more improvement was shown on this test than on the previous two.

Proofreading. Students were asked to proofread for spelling, punctuation, sentence structure, paragraph structure and relatedness of specifics. Over half of the students made noticeable improvements. Fourteen students omitted the unrelated specific on the post-test, while only three had done so on the pre-test. Fourteen correctly joined fragments on the post-test as compared to three on the pre-test. Of the four who corrected spelling mistakes on the pre-test, two did so correctly. On the post-test, nine out of the 15 making corrections made correct corrections.

TOAL: Listening/Grammar. Students were tested for sensitivity to similar (spoken) grammatical structures, a task involving their receptive grammatical knowledge. About one quarter of the students showed no change, one quarter of the students improved, and half of them got worse.

Reading/Grammar. Students were tested for their ability to recognize syntactically different (written) sentence structures, again, a function of their receptive grammar. The results were similar; approximately one quarter of the students showed no change, one quarter of the students improved somewhat and half of them got worse.

"The results were quite different in this test... [which] ...tapped their active/expressive grammar.'

Writing/Grammar. The results were quite different in this test, where students' ability to utilize English syntax in writing was tested. This tapped their active/expressive grammar. About half of the students lost a little ground, but half of the students improved by even wider margins.

Speaking/Grammar. Students' expressive spoken grammar was assessed on this test. Again, over half of the students made impressive gains, while one quarter of the students showed no change and one quarter of them showed minor loss.

General Testing Observations

The consideration that seems to be the most significant in making sense of the full array of results is the distinction between active/expressive tests or tests that were couched in the context of a full paragraph, and passive/receptive tests or tests that were made up of tasks isolated from that context. All the improvements that students made were made in the active, paragraph-size tasks: organizing specifics into paragraph form, proofreading, Writing/Grammar and Speaking/Grammar. Students' performance on tasks isolated from paragraph context (crossing out unrelated specifics in a list; categorizing/outlining items in lists) and the receptive tests of Reading/Grammar and Listening/Grammar showed no improvement and in some cases showed some loss. Students exhibited greater sentence sense in both the TOAL and proofreading tasks and a much greater tendency to make corrections (and a greater ability to make correct corrections) on the proofing task.

Implications of Testing

The improvements in active, expressive writing tasks seem to point to a positive experience in the interaction with the Macintosh. Writing with a non-judgmental interactor like the Macintosh which facilitates the writing process by eliminating the high cost of correction and experimentation seemed to give students the self-assurance to "take charge" of their writing, to make corrections, to write enough to learn more about how to go about the process of writing, and to function confidently *within the context of the writing experience*. The fact that the passive and task-specific tests went down is not alarming; it simply indicates that, since students' writing abilities *per se* improved, knowledge of these isolated skills are not necessary to the writing process. The implications for teaching are obvious. Interaction with the Macintosh computer in the writing process and the use of the Macintosh as a writing tool can be effective, positive, and beneficial components in a writing program for LD adolescents. In addition, breaking down the teaching of the writing process into specific tasks is non-productive; those tasks do not seem to contribute to improvement in writing.

Teacher Observations

In round table discussions after the post-testing was done, teachers who had charted the progress of the students involved through the year of work in the Lab compared their impressions and observations. Some observations were unanimous: students working on the Macintosh were using much more sophisticated vocabulary and sentence structure than they had been in the fall. They were generating much greater quantities of written material. They were even using the Macintosh to make an outline before they sat down to write paragraphs.

It seems clear that students produced more sophisticated writing and greater quantities of it for two reasons: first, because the computer is such a non-judgmental facilitator, and second, because it separates writing from hard copy, making a distinction between the process of creation and the tangible result. What is difficult for these students is the physical production of the piece of output. Since the writing process itself is divorced from that physical production, students did not have to limit themselves to the "easy" words, the "little" sentences that they had a tendency to use in order to avoid making mistakes and therefore corrections when writing by hand.

"...they could concentrate on how to code the relationships between their ideas...."

The outlining program Acta was a great enabler for some of them as well; freed from having to create the mechanics of an outline, they could concentrate on how to code the relationships between their ideas and, again, with the physical mechanics out of the way, they could realize the benefits of pre-planning. On the other hand, not all students found Acta to be helpful conceptually. Acta gives structure to thoughts, potentially both a help and a hindrance. For the students who were willing/able to think and write in parts and still in need of external structuring, the program was extremely useful. But for those students who thought holistically or who were not able to break down the conception of their ideas into component parts, the program was frustrating. They were not capable of working with their ideas in a piecemeal fashion, i.e., they could not break their thoughts into units from which they could use Acta to construct an outline. The flip side of that were the students who *were* capable of breaking down ideas *and* structuring them. For them, the program was an unnecessary complication in their approach to the writing process. Teachers also observed that students did not make as many reversals, transpositions or spelling errors in the first place, and definitely caught many more of them in their computer-aided writing than they had in their handwriting. It is not quite as easy to explain why this should be so. Certainly one major factor to increased accuracy in proofreading is the fact that, having typed their ideas onto a screen, the students were able, some of them for the very first time, to read their own writing. For dysgraphic students, the revelation of actually being able to decode easily something they had just written was a primary factor enabling them to improve their writing; for the first time, these students were able to benefit from self-generated feedback. Even students who still had problems with decoding the printed word had less trouble with the Macintosh representation of their work than they did with their own handwriting; the high resolution screen makes for a clear image and the black-on-white printing recalls the standard text representations they are used to. The greater ease of reading coupled with the confidence they gained as a function of working with the Macintosh enabled these students to read more of their errors physically and to recognize them cognitively, so that they could correct more of them. Further, these students were not only more able to revise their work, they were also more willing. Proofreading and revising on the Macintosh, divorced from the scratching out and messy erasures of editing hard copy, are no longer the overwhelming tasks they once were.

"For dysgraphic students, the revelation of actually being able to decode easily something they had just written was a primary factor enabling them to improve their writing...."

"...these students were not only more able to revise their work, they were also more willing."

But the question of why spelling should be better and why reversals and transpositions should be made less often is not clear at this point. Is there something in the nature of the student/computer interaction that circumvents the processing problems that result in spelling errors for these students? Or is it something as simple as the fact that the effort of keyboarding forces the students to be more conscious of their work and thus to use the knowledge that they have been taught in their LT classes?

Future Research Questions

These questions will guide some of the work to be done in the coming year in the Computer-aided Writing Project research program. We will also do documentation that will allow us to put numbers to our initial assessment of greater writing quantity and sophistication of vocabulary use and sentence structure. Another interesting observation that we would like to pursue was suggested to us by Shirla Edwards who works with learning disabled students in a Microcomputer Demonstration Lab at Montclair High School, New Jersey. She observed in one of her own dysgraphic students an enormous improvement in handwriting after the student had had the opportunity to do much of his writing on the Macintosh. It will be interesting to follow up this observation with some investigation of the effects of using the Macintosh on the handwriting of dysgraphic students. It may be that some of the illegibility of students' writing is due to their reluctance to have people read what they have written and to their masking of their mistakes with orthographic vagueness (haven't most of us at one time or another, when not sure if it was ei or ie, made what could be construed by a sympathetic reader as a loop in each letter and positioned the dot squarely in between the two?). In this regard, it will be useful to look at a personality index for each student before and after his/her year of work on the Macintosh to determine what sorts of gains in self-image and self-esteem have been made.

Pedagogical Implications

Some further observations have clear implications for the mode and content of student/teacher interaction with the Macintosh in the writing process. Whether keyboarding skills are an essential prerequisite to using the computer as a writing tool is sometimes considered controversial. In our Lab, students who did not have handwriting problems and who tended to be impulsive, holistic thinkers, were frustrated by the fact that their slow keyboarding kept their fingers from keeping up with their thoughts. This frustration prevented them from writing enough to learn better keyboarding skills solely as a by-product of their writing experience. For them, keyboarding instruction *per se* was necessary. For the great majority of our students, however, we found keyboarding to be a non-issue. As long as they didn't have to do the writing by hand, dysgraphic students weren't at all bothered by how long it took them to peck out their thoughts. The benefits of not having to write and, again, of seeing their thoughts in legible form far outweighed any initial frustration, or perhaps more accurately put, dispelled it altogether. The motivation level for these students was high enough that they continued to write, and wrote often enough so that keyboarding, albeit their own brand of it, came easier and easier.

Spelling Checkers

Another issue of less concern to general computer-aided writing circles, but of great concern where LD adolescents are involved is the use of a spelling checker program. Like Acta, a spelling checker has features that make it an advantage for some students and a disadvantage for others. It would seem obvious that, for students for whom spelling is difficult at best, a spelling checker program would be an essential tool. However, in the course of using such programs with our students (primarily WriteNow and Spellswell), several things became apparent. First of all, the program had to be fairly good at coming up with "guesses" for alternatives to misspelled words.

Dyslexic students far more often than non-dyslexic poor spellers make mistakes on the first letter(s) of words; if a spelling checker "guesses" on the basis of first letters alone, the student will be frustrated by the inability of the program to give him/her any alternatives to the word it has flagged as wrong. Thus, a fairly sophisticated program is required in order for it to be useful at all. Second, for very poor spellers, having a spelling checker flag as misspelled a large number of words in a piece of writing can generate a sense of failure as debilitating as the learning disability itself, especially coming on the heels of the excitement and hope created by working on the computer. Third, spelling checkers are not omniscient. Even where the program is capable of coming up with alternatives for the misspelled word, it is still the student who must determine which, if any, of the alternatives is correct. Thus, spelling checkers cannot be a simple replacement for the remediation of basic spelling skills; the student needs to have those skills in place in at least a receptive sense to be able to utilize the power of a spelling checker.

"...spelling checkers cannot be a simple replacement for the remediation of basic spelling skills..."

For all these reasons, then, it is important that care be taken with how a spelling checker program is presented by the teacher and what guidelines are set up for its use by the student.

Curriculum Guide

The Computer-aided Writing Project research program will continue to look at the questions outlined above and continue to examine the ways in which we use the Macintosh as a writing tool for LD adolescents. A necessary step in preparation for further research, however, is the use of our preliminary findings to generate a curriculum and teaching guide that documents what we have found thus far to be the most effective sequence and content for a computer-aided writing program for these students. The guide will be based on the results of our research and on the observations made by our teachers and by the directors of the Lab throughout this past year. It will serve as the framework for the teaching of our students in the program next year and will be expanded and refined as our experience teaches us more and more about how to help unlock the writing potential of these students using the Macintosh as a writing tool.

Epilogue

It is a year and a half after the possessives episode. By now John and I are quite spoiled by having a Macintosh at our daily disposal. And I am spoiled by constant exposure to the tremendously positive effects it has on John's ability to express himself. But even at that I am taken aback one day. We are both settling into the beginning of the class, me with my usual banter about homework and seniors, but John strangely silent. I look up to see him bent over the keyboard, now with two hands in the semblance of touch typing that he has taught himself. I start to chide him (his favorite way to waste time in class is to rearrange his disks or change the pattern on my desktop) but get no response. I find myself strolling over to his side of the table again. This time what I see written begins "You are going to be mad at me. I started to do the homework last night but there was a play that all the seniors had to see and after that..." John, a "typical" dyslexic, for whom written expression has been an anathema for his entire school career, is **choosing** *to communicate with me in written form.*

Computer-aided Composition: Looking Backward

Tim Shaw

"I am still learning."
-motto of Michelangelo

The brief respite between the academic year and Forman Summer School is a time for taking stock of what we did in Composition in the Macintosh Lab this past year. Some desireable changes became clear during the year, some of which—need to reach more students, need to deal with basic writing skills—are being dealt with partially through expansion of the Lab for next year and the institution of the course Thinking and Writing (see article "Thinking and Writing" elsewhere in this issue).

I have always believed that a composition course—especially a composition course in a college-preparatory curriculum—must deal with more than mechanics: allowance must be made for creative students for whom a regular linear structure—either in writing or in the course itself—is a limitation. Writing is not only a process, with the connotations of steps and rules, but also is (by virtue of its connection with the author's thoughts) an organic evolution, with all the connotations of evolution: growth, unforeseen branching, new directions, etc.

Therefore, we need a composition course for students with basic writing skills already in place. Less time would need to be devoted to mechanics; brainstorming and the writing itself would not have close supervision as in Thinking and Writing. This course would concentrate on, not how to write, but what to write. These students will benefit from exposure to both creative writing and the art of persuasive writing: rhetoric.

Before I get sidetracked onto the subject of rhetoric, however, let me say more about what we learned from this year's Composition class. Major areas needing attention are Time Factors, Structure, and Macintosh Concerns.

Time Factors (or, "Rome Wasn't Built...")

Next year's class will meet six days a week (Forman has an abbreviated Saturday schedule), as opposed to the three days of this past year. Thank Heavens! Composition needs to be full-time, not only for the academic benefits, but to avoid the dangerous psychological side-effect that a half-time course has on students: it is only half-time and half-credit, so it is not as important as my other classes; ergo, why work as hard? Also, what the students learn about the Macintosh is easily forgotten without constant reinforcement. For instance, try teaching command keys when they use them three days a week for less than 40 minutes each time (the best command keys have built-in mnemonics: Q/Quit, B/Bold, etc.; Acta's A/Aunt, S/Sister, D/Daughter, are better remembered than X/Cut or V/Paste).

Structure/Stricture

"There are times when you have to throw away the book." Planned departures from the pressure of writing were among the most fruitful times in class. Due to some holiday, one class was a day ahead of the other. For my convenience, I like to keep the classes even, so I gave one class Racter, an interactive dialog simulation program to play with. I had each student pop in the disk simultaneously, so that each would be greeted by Racter at the same time as the others (and no one got distracted from his own screen). Up to this point, we had not heard any sound from the Mac except the startup beep. The novelty of carrying on a conversation with this conversing program made both the words flow from their fingertips and the period fly. Of course, the fact that they had to spell and use a question mark properly reinforced these mechanics in a pleasant way. Calculated playtime can help. (Mindscape has a crossword puzzle making program that has just been re-written for the Mac; I hope to see how that can spice up classes further.)

Macintosh Concerns

Macintosh programs are user-friendly and often intuitive. Intuition for such programs, however, takes time and experience to develop (see above). With a six-day week, moreover, time can be devoted to keyboarding skills! Once keyboarding skills are learned (and there are several good programs for teaching them), the writing will proceed more quickly and easily.

Looking Forward

...and that—in general terms—is what we learned from this year. Composition needs to be full-time to learn about both composition and the computer. Full-credit status also guarantees that students take it as seriously as other courses. Other programs should be tossed in occasionally as a respite from the regular grind and to reinforce good habits in creative ways. I will probably have another article to write in 12 months' time telling what I discovered in a full-time Computer-aided Composition course (Michelangelo comes to mind). After all, with a six-day week for nine months, there will be twice as much time to experiment and make mistakes.

Thinking and Writing

Karen Craig

As you can probably tell by now, the Forman Macintosh Lab is an exciting place to be. I feel privileged to be involved and to have the opportunity to work with and learn from the other people involved. One of the most important things I have learned is that the Macintosh is a fine tool for teaching dyslexic students.

New Class

Next year I will be teaching a new class in the Lab called Thinking and Writing. It will be a part of both the Language Training (LT) Department and the Computer Department. The course is designed to meet the goals of the LT curriculum. To meet these goals, the course will use the process approach to writing with the Macintosh computer as the vehicle. Instead of the traditional one-to-one LT classroom setting, this class will meet in a four-to-one setting. Group interaction skills, study skills, and literal and critical thinking skills will all be addressed.

Process and Learning

I credit Donald Graves' book Writing: Teachers and Children at Work and my own painstaking experiences with writing for the methods I use when teaching the process approach to writing. A goal that I personally have for the class is that students learn that *learning* is a process, and that learning should be personally meaningful. My intention is that isolated skills would be practiced only after needs are demonstrated. Educators and students must remember that mistakes are really lessons. It is from mistakes that we determine what needs to be learned.

Pre-Writing and Writing

Students and teacher brainstorm topics for writing. It may be difficult for students/authors to determine their own topics because educators have traditionally directed students' writing instead of letting students "own" their pieces of writing. I feel that ownership of a piece of writing is important; therefore, the student/author should determine the topic. Graves' book has many good ideas on ways to brainstorm.

Once a topic has been determined, *pre-writing* takes place. Pre-writing is different for different people. Some people just start typing ideas; others may use an outline format; others may use mapping. Mapping uses a visual/hierarchical structure to show relationships between ideas. During the pre-writing stage the goal is just writing and not worrying about order, mechanics or aesthetics. These are all important, but come at a later stage.

During the pre-writing stage a student determines a topic and begins brainstorming. One tool that the class will use for pre-writing is Acta, an outlining program. The editing and revising capabilities of Acta allow students to re-organize topics easily. Next, students will use Acta to expand their ideas into complete sentences. Some of the frustration of writing drafts is eliminated because of the electronic editing capabilities of Acta and other writing programs. Acta also enables students to work on logic and time order (study skills). Acta offers a structure to students who need it.

Some students may need this structure because they may have been initially taught to write by following a pre-determined structure.

Writing

The next step is writing. Students paste their work into a word processing program. Using a word processing program, students are able expand their writing from an outline format into a paragraph format. This can be done by continued expansion from ideas into thoughts and sentences. During the writing step of the process, students write to the best of their abilities. Their topics should be focused, a purpose for writing the piece should have been determined, and the audience should have been determined. At this point they shouldn't be brainstorming; rather, they should be concerned with content and clarity.

Student-Student Conference

The group shares each other's work during the *conferencing* stage of the process. Teachers must be very careful when determining the time to call a conference because the group first has to be taught some ground rules about how to work within the group—what is and is not acceptable behavior and group interaction skills. From my experience, the best way to teach this is to model it. Modeling is very important and the teacher should be a *part* of the group. When the group writes, the teacher writes. When the group holds a conference, the teacher is part of the conference group. A conference has three main steps: reflecting, commenting, and questioning.

Reflecting and Commenting

The author reads his piece of writing aloud to the group. When the piece is completely read, each member of the group responds to (reflects on) that piece of writing. Each group member may summarize what he has heard, which involves listening/literal comprehension, or he may respond by saying aloud the mood he felt the writing displayed, which involves inferential comprehension. This is important feedback for the author, because it lets the author know if the audience has heard what he is trying to get across. Next, each member of the group gives some positive feedback about the piece of writing. It is important for all to hear good things, and there is always at least one good thing to say about a piece of writing, even if it is just, "I liked the word 'fantastic' because it made me identify with how you felt."

Questioning

Lastly, the group responds to the piece of writing through questioning (literal and critical thinking). Questioning helps the author determine what needs to be added, taken away or changed around to clarify the writing. The group needs to be shown how to question in a positive manner, so it is important for the teacher to model how this should be done. For example, instead of asking "Why didn't you tell us your brother's name?" the question could be "What is your brother's name?" It is a much more positive approach to constructive questioning, and it leaves the option open for the author to determine if he wants to tell the audience what his brother's name is.

Re-Writing, Student-Teacher Conference

After the group members have responded to each other's work, the students probably have a direction. Most of the time, students want to revise and clarify their work. Generally, they want to clarify questions the audience raised. This step of the process is called re-writing.

Students revise, completing the writing to the best of their ability, before holding another conference. Even though the students may choose a peer-conference again, they ultimately must have a one-to-one revising conference with the teacher. Because this is again a revising conference, there is no mention of editing for mechanics or aesthetics. The teacher responds the same way the group did before. The difference between a peer-conference and a one-to-one teacher conference is that the teacher offers point-of-error instruction, if necessary. The teacher focuses on one need rather than all. For example, if the student has shown difficulty in sequencing, the teacher addresses that need in the one-to-one conference.

Dealing with Mechanics

Only when a piece is finally clarified and revised to the student's best ability does editing for spelling and mechanics begin. WriteNow, one word processing program for the Macintosh, has a built-in spelling checker, allowing students to edit for spelling with greater ease. After a student edits for spelling and mechanics to the best of his ability, he is ready for an individual editing conference with the teacher. The teacher looks at the written work and then instruction focuses on a mechanical error rather than all of the errors. Instruction takes place as the need arises; it is personal and therefore especially meaningful. After some practice and use, the teacher can expect the student to use that knowledge in future pieces of work. After the editing conference, the student makes a final draft and "publishes" his piece of work. The satisfaction of an immediate aesthetic result is great because of the printing capabilities of the LaserWriter.

Group Instruction: Mini-Lessons

Often, the group's writing indicates similar needs for instruction. When this happens, group instruction or a mini-lesson is provided. These mini-lessons can be provided at any point in the writing process For instance, if the entire group's work indicates the need for instruction on the development of leads, they then receive group instruction in that area.

Conclusion

Besides learning that writing is a process, how to write, and many basic language skills, students also learn other important life-skills: literal and critical thinking skills, group interaction skills, and the ability to give and take constructive criticism. Most important, though, is that students begin to realize that all learning involves working with and understanding processes.

I look forward to Fall Term and teaching this class. I also look forward to using the Macintosh computer as a tool to aid in the learning process. I know what growth can be achieved and what satisfaction can be felt without computers; there is bound to be even more success seen with the revising and editing capabilities available with Macintosh programs.

The Forman Font

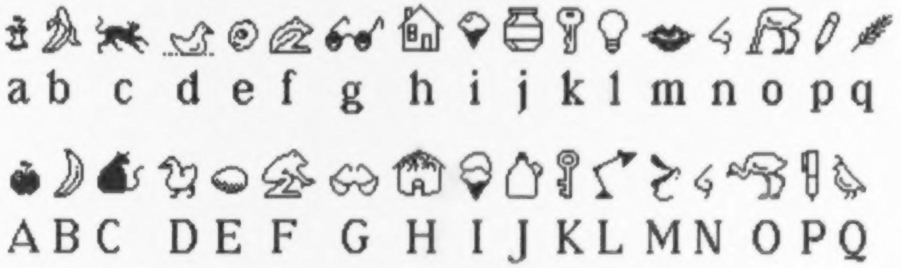
Emmy Pellico

Fontastic

A font is a particular typeface or letter form; the font that you are reading now is called 12 point Times. Most software that runs on the Macintosh computer allows users to change fonts at will, and there are many fonts to choose from, even outside of the standard ten or so that Apple gives users when they purchase a system. One can also create one's own fonts in a number of ways, but the simplest is with a type of program called a font editor. I used the font editor Fontastic to develop a font for The Forman School. I thought a font based on pictures rather than words would be appropriate for a school which serves the needs of dyslexic students who have a hard time decoding letter forms.

After a lot of revision and some pre-release use here at Forman, I have finally produced a finished font. 18 point Forman is a mnemonic picture font, meaning that the word that describes each picture is associated with the letter on the keyboard that the word begins with. Below are a few examples of the font.

Partial Representation of the Forman Font


a b c d e f g h i j k l m n o p q
A B C D E F G H I J K L M N O P Q

Disk

If you would like to have the font on disk, send $5 to:

Emmy Pellico
The Forman School
Litchfield, CT 06759

I will send you a disk initialized single-sided with the 18 point Forman font and the Font/DA Mover on it. The disk will not have a System Folder on it so you will have to start your Macintosh with a disk with a System Folder on it in order to install the font. Please see your Macintosh owners manual for instructions on how to use the Font/DA Mover (it's very easy). I'll also include some surprises on the disk for you to look forward to.

Rebuses and more

Of what use is a picture font? Good question. You could write a letter in a standard letter-font like 12 point Geneva and then change it all into 18 point Forman. When you send it you could include a note (in Geneva) saying that the receiver is to decode the letter. A picture font that is mnemonic is also terrific for making rebuses. If you type a picture in the Forman font in MacPaint, you can lasso the picture and then move it around, duplicate it, stretch it or manipulate it in countless other ways. I'm sure you will find many other uses for the Forman font, and I hope you enjoy using it.

The following two articles were written by Forman students. More can be found about them in the Contributors section on page 18.

What the Macintosh Has Done for Me

Steve Carberry

I am a senior at The Forman School, and I have been using the Macintosh for almost a full year. A year ago I was uninformed about how to use the Macintosh. I have always been interested in computers and I have experience with programming on the Apple II. Last year, Richard Wanderman came to The Forman School and put on a Macintosh workshop for all of the students and faculty. Involvement in this workshop really got me interested in the Macintosh.

"I found that the Macintosh is much easier to use than the Apple II."

There were only a few Macintoshes on campus at that time, and it was hard to get time on them, and there were only four Macintoshes in my dorm last year that were owned by students. I was allowed to use them on occasion. I encouraged my LT teacher to get us time on the Macintosh that was used by the LT Department. We worked one day a week and began to quickly catch on to using the machine. I found that the Macintosh is much easier to use than the Apple II. After working in the Lab here on campus I became good at working with the Macintosh and I conviced my parents to get me one.

Since getting my Macintosh, I have used it intensively almost every night, working and playing with Acta, MacWrite, MacPaint and MacDraw. I am using a new writing program, WriteNow, to write this article. WriteNow has a built in spelling checker which is very helpful to a dyslexic student. WriteNow is different from other writing programs because it makes it easier to correct spelling errors. I am also using Acta, an outlining program, which helps me to brainstorm ideas for writing, and organize my ideas. Both WriteNow and Acta help me greatly in my writing. I seldom write with a pencil anymore because I now use my computer for all sorts of work. My typing speed and accuracy have increased along with my writing ability.

"The Macintosh will help me in college and in life."

With the Macintosh I will be able to keep my schedule for the day and for the week. I will be able to write letters and papers easily and it will help me with my organizational skills, including organizing my finances. The Macintosh will help me in college and in life.

Aron Does "Update on Aron"

Aron Sheehan

If you have been reading about me in the last two issues of *The Monitor*, you know that Mrs. Craig, my Language Training teacher, has been writing about me. But one day I told her I would like to write about myself. It is apparent that I am a student at The Forman School. I am in the 10th grade.
For the last 9 months I have been using the Macintosh; it has been a big part

of my life. This is because Mr. Wanderman, the Lab Director, has showed me the capabilities of the Macintosh. When I first was introduced to the Lab, I had never seen a Macintosh. It has been most beneficial in my writing as well as in the organization of my thoughts. Using the Macintosh for writing has improved my reading. The more writing I do, the more reading I do. The most difficult problem I face is reading and spelling, but I am making progress slowly. I am using programs such as WriteNow, Acta, MacPaint and MacDraw. I use MacPaint and MacDraw to draw objects that I can't write about. I use MacPaint and MacDraw because it is easier and more enjoyable than sitting down and writing a paper, being frustrated, bored or both. I use Acta to organize my thoughts. I am using Acta more and more as I find out how beneficial and easy it is to use. My favorite program is WriteNow which is what I am using to write this article. WriteNow is better for me than MacWrite because it has a spelling checker and it runs faster.

"Using the Macintosh for writing has improved my reading. The more writing I do, the more reading I do."

I was afraid to write at first because of all the hard work involved; then I realized that everyone must go though this difficult process of writing. For me, the process of writing starts with brainstorming, then I organize my thoughts, I edit and revise, and then I have the final written product. I am a slow writer, and it is hard for me to write what I want because it takes so long to write; my handwriting is not fast enough for my thoughts, but typing on the Macintosh is far easier and a faster way for me to get my thoughts out.

"...my handwriting is not fast enough for my thoughts..."

I get the opportunity to write more on the computer here in the Lab. Mr. Wanderman has found out by going to different conferences throughout the country that we are one of the few schools that has a Lab like this one. We don't do programming in the Lab. The Lab is involved in writing because the teachers here feel that work with writing is most important for Forman students.

I learned that the best writing comes from the writer. Take this article for an example, all of the words are my own and they represent the way I feel.

Teachers such as Mr. Wanderman and Mrs. Craig have worked with me throughout the year. Mrs. Craig has worked with me strictly on writing, spelling and reading. Mr. Wanderman has worked with me on graphics, how to use different programs and teaching me shortcuts for the Macintosh. Next year, he is offering an advanced computer course which will be dealing with computer-aided writing and introduction of other computer related areas such as business applications, telecommunications, graphic design, electronic page lay-out, simple programming with Logo and an overview of how computers work.

Many other students at Forman have benefitted as I have from using the Macintosh Lab. As you can see, I have had a positive and productive year using the Macintosh and I know there will be a lot more to come. I would like to say thanks for reading about me.

"Many other students at Forman have benefited as I have from using the Macintosh Lab."

Contributors

Richard Wanderman has an MFA in Fine and Applied Arts from the University of Oregon, Eugene. He has taught ceramics, design and computer-aided design at the University of Oregon for the past four years. He has also written, lectured and done workshops about the connection between personal computers and dyslexia. He is currently directing the Computer-aided Writing Project at The Forman School.

Tim Shaw received a BA in English and Classics from St. John Fisher College in Rochester, New York, and an MA in Medieval Studies from The University of Connecticut. As a Graduate Student Teacher at UConn, he received the 1984 Award for Academic Excellence. He has taught English Literature at Forman since May, 1984. He currently teaches Composition on the Macintosh at Forman.

Emmy Pellico has a BS in graphic design from the University of Oregon, Eugene. She has produced a variety of publications for the University of Oregon and Eugene businesses with the Macintosh and LaserWriter printer. She is currently assisting in the running of the Forman Macintosh Lab, teaching a variety of courses and producing some of Forman's publications in the Lab with the Macintosh and LaserWriter printer.

Dr. Laurie Fais received her PhD in Linguistics from Indiana University in 1981. In 1982, Dr. Fais came to The Forman School to teach Language Training and act as Director of Professional Development. She is currently the Head of the Language Training Department and is involved with the Forman Computer-aided Writing Project. Dr. Fais helped to write the Language Training Department curriculum and has presented papers on teaching linguistics to dyslexic adolescents and on the LT curriculum.

Karen Craig received her BA from Muskingum College in New Concord, Ohio. Since then, she has taught school in Pennsylvania and New Hampshire, where she was involved in curriculum development in the area of the process approach to the teaching of writing. She is a Language Training teacher at The Forman School and will be teaching the experimental class, Thinking and Writing as part of the Forman Computer-aided Writing Project.

Steve Carberry graduated from Forman this spring. He is from Stillwater, Oklahoma and will be going to college at Oklahoma State next year. Steve owns his own Macintosh and has done a considerable amount of his school work with it this year. Steve will be a lab assistant in the Forman Macintosh Lab this summer.

Aron Sheehan has just finished his first (Sophomore) year at Forman. He has been an integral part of the Forman Macintosh Lab and the Computer-aided Writing Project. There are only a few students whose writing has been affected as much by the use of the Macintosh as Aron's has. Aron will be a lab assistant in the Forman Macintosh Lab next year.

Products Mentioned

Retail prices are in parentheses. Products can sometimes be purchased through mail-order houses for less.

Macintosh SE HD20 ($3569.), **Macintosh Plus** ($2199.), **LaserWriter** ($4995.), **MacWrite** ($125.), **MacPaint** ($125.), **MacDraw** ($195.), **Font/DA Mover** (free with purchase of a Macintosh). Apple Computer, Inc. 20525 Mariani Ave., Cupertino, California 95014. 408/996-1010.
SuperPaint ($99.), Silicon Beach Software, 9580 Black Mountain Rd., P.O. Box 261430, San Diego, California 92126. 619/695-6956.
Acta ($59.95), Symmetry Corporation, 761 East University Dr., Mesa, Arizona 85203. 602/844-2199.
PageMaker ($495.), Aldus, 411 First Avenue South, Seattle, Washington 98104.
Fontastic ($49.95), Altsys, P.O. Box 865410, Plano, Texas 75086.
Racter ($39.95), Mindscape, Inc., 3444 Dundee Rd., Northbrook, IL 60062.
WriteNow ($175.), T/Maker Co., 1973 Landings Dr., Mountain View, California 94043.

Glossary

A list of computer-oriented and education-oriented terms which have been used in this and past issues.

Dyslexia A neurological difference that causes difficulty with reading and writing. Dyslexia is a developmental disability; it can be affected by environmental factors.

Dysgraphia A neurological difference that causes difficulty with handwriting and other types of symbol making. Usually associated with dyslexia.

Kinesthetic Referring to the sensation of bodily movement. In the field of learning disabilities, used to denote a learning channel separate from visual and auditory. Kinesthetic learners learn best by literally "going through the motions."

Multi-sensory Processing information through more than one sense or presenting information to more than one sense. Multi-sensory feedback is a feedback system where many senses are involved.

Point-of-error instruction Instruction determined by the nature of errors made by a student in the course of previous work.

Process Approach to Writing Focus on and use of the entire writing process, rather than the resulting product, usually starting with unstructured writing and later moving toward structure, mechanics, and spelling correction.

Font A complete set of characters in a typeface or letterform. What you are reading now is a font called 10 point Times.

Font Editor A Macintosh program that facilitates the creation and editing of fonts.

Rebus A message composed of words and pictures where the pictures suggest the sounds of the words they replace.

MacWrite A Macintosh writing (word processing) program.

Acta A Macintosh outlining program.

MacPaint A Macintosh drawing program.

MacDraw A Macintosh drafting program.

SuperPaint A Macintosh drawing and drafting program

Spelling Checker A computer program that reads a text file, flags words that don't match its dictionary and offers suggestions for correction and replacement.

Finder A Macintosh system program that manages files and directories of files. The Finder is a visual shell for the Macintosh operating system. When you put a startup disk in the Macintosh, the program that automatically starts up is the Finder.

System The System file on a Macintosh disk contains the operating system of the computer. It also contains resources that all programs on that disk share. Some of these are fonts and desk accessories.

Font/DA Mover A Macintosh program that facilitates the movement of fonts and desk accessories in and out of the Macintosh System File.

Hierarchical File System (HFS) The folder system that the Macintosh operating system uses to store files in a hierarchical fashion.

Mouse A small box-like attachment that, when moved on a flat surface, makes a cursor move on a computer screen. It is a powerful replacement for cursor keys on a keyboard for most applications.

Icon A symbol. The MacWrite program symbol and the Trash can are icons. With the View menu you can arrange your files by Name instead of by Icon.

File Information stored as a unit on a disk. Programs as well as the work done with them are files on a disk. Macintosh files are represented by icons or names in disk windows.

Hard Disk A high-speed, high-capacity, fixed disk. A hard disk might hold 20 megabytes (billion bytes).

Kilobyte 1024 bytes (sometimes rounded off to 1000). Sometimes called a "K."

Megabyte 1024 kilobytes (sometimes rounded off to 1,000,000). Sometimes called a "meg."

Desk Accessory Small programs that are accessible while a larger program is running. A DA allows the user to access two programs at once.

RAM Random Access Memory. A RAM is a type of memory chip. The Macintosh has either 128K, 512K, 1024K or more RAM in it. There are banks of RAM chips soldered to the main circuit board inside the machine. RAM holds programs (MacWrite) and data (your writing) so that the microprocessor can work with them.

ROM Read Only Memory. A type of RAM chip that holds essential information and cannot be used by you to store new information.

AppleTalk A local area network that connects Macintoshes to each other and to shared peripheral devices, such as printers.

AppleLink A network with a BBS in Detroit as its hub. Also, a telecommunications program enabling use of the network.

Public Domain Software Free software distributed publicly through computer users groups and over BBSs.

The Macintosh Lab Monitor

A quarterly publication documenting the Computer-aided Writing Project at The Forman School

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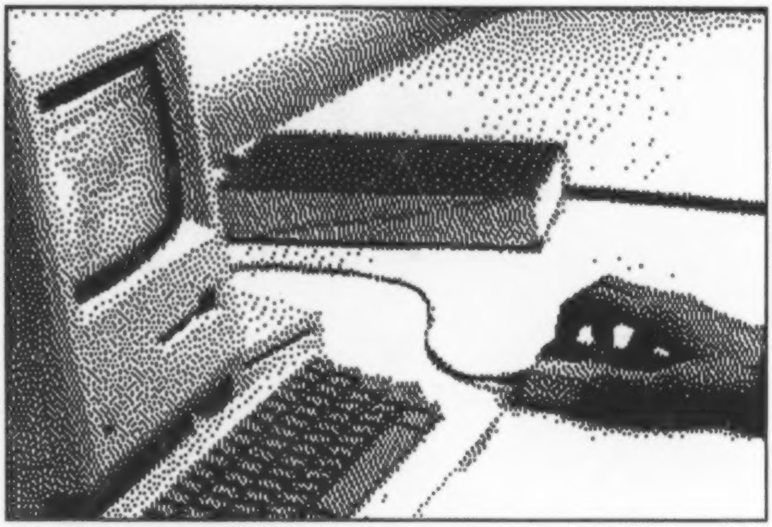

#4

Summer, 1987

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Project Overview

Richard Wanderman

With this issue of *The Monitor* we mark the end of our first year of the Computer-aided Writing Project at The Forman School. It's been quite a year. When we arrived, the school owned four Macintoshes and a LaserWriter. There had been 400 copies made on the LaserWriter and only a few people knew how to work with it. Two faculty members owned Macintoshes and about six students came to school with Macintoshes. There are now over 18,000 copies on our LaserWriter (everything from student assignments to this newsletter) and the school owns 32 Macintoshes; there are 18 faculty who personally own Macintoshes and by mid-year, 40 to 50 students (out of 230) will own Macintosh computers. Many of the faculty who don't (yet) own their own Macintoshes use the Macintosh Lab on a regular basis for doing reports, making up tests, and doing personal work. Most of the Forman Macintosh community uses the Lab for laser printing. We are considering purchasing another LaserWriter for our administration building.

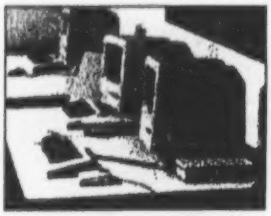
New Roles

It's wonderful to have so many people in a small community excited about the Macintosh, but with that excitement comes a great deal of focus on me and, to a lesser extent, Emmy Pellico (who runs the Macintosh Lab with me) to answer questions, get people out of fixes, order materials, teach people how to use software, install machines, and generally educate our community on how to use and take care of this new tool that we all use and are becoming dependent on. The responsibility sometimes pulls me away from my primary purpose here, which is to administer, teach, do research and present research findings on the Computer-aided Writing Project. I don't resent the new role(s); I'm just learning how to deal with them.

Teaching

This year I'll have more help with teaching. Tim Shaw will continue to teach Introduction to Computer-aided Writing on the Macintosh (now a full-time, full-credit course) and Emmy Pellico and I will continue our individualized work with Language Training students. In addition to this we are offering three new courses: six sections of Thinking and Writing, a small-group process writing course taught by Karen Craig and Nigel Daniel (see *The Macintosh Lab Monitor* #3 for more on this course); Computer-aided Design, taught by Emmy Pellico, and Advanced Macintosh taught by me. We also have some free periods in the Lab so that other courses can now use it on a rotating basis to supplement classroom coursework.

We are looking forward to an exciting year, not only at Forman with our courses and Lab but also on the road. Dr. Laurie Fais, myself and various other members of The Project will be presenting at a number of national and regional conferences this year. Laurie and I have begun the task of putting into writing a basic curriculum/guide of what we are doing and our rationale for doing things the way we have. The curriculum/guide will appear in part(s) here in *The Monitor* and will then be published under separate cover. We will try to have it finished (in its first version) by the end of this academic year.



In this issue of *The Monitor* we explore the area of computer-aided drawing and what it means to the dyslexic/dysgraphic person. Also in this issue is a brief overview of the recent exciting Boston Macworld Exposition, which a number of people from Forman attended, and a description of the most significant software product I've ever seen on any computer, HyperCard. HyperCard is so significant that a group of Forman faculty will be developing a number of applications with it to handle much of the information interchange of our school. Lastly, I've received many requests, especially from librarians, to publish a yearly index of *The Monitor*, so you'll find one in this issue.

Computer-aided Drawing

Richard Wanderman

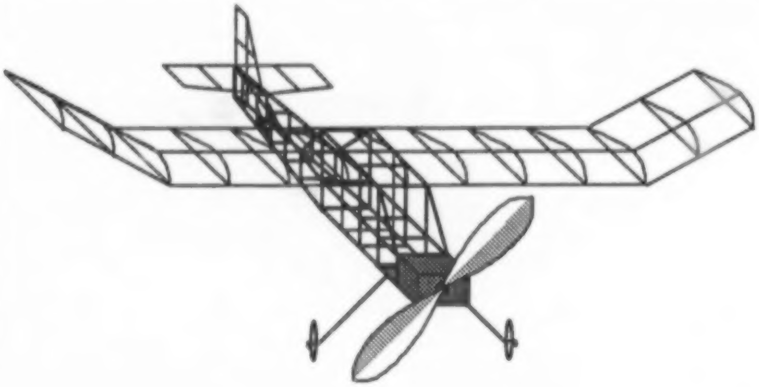
The minute I told my student, Jon, that we would be spending some time learning how to use MacDraw, a Macintosh drawing program, I could see him physically tighten up, just as if I had said that we were going to be doing some writing. This puzzled me, as Jon is an extremely visual person; he not only expresses ideas verbally in terms of visual analogies, but he can manipulate and understand complex things in his head using his own, personal visual modeling system. Still, he didn't consider drawing a medium that was accessible to him.

The Problem

The dyslexic/dysgraphic person not only has trouble with the formation of letter forms, but many times with drawing in general. Traditional drawing, like writing, is done with paper and pencil or pen. The composition process is wed to the printed product and a mistake usually means either erasing or starting the whole drawing over again. Also, like writing, drawing skill comes from experience with the process: if a person doesn't draw (because he's scared of making mistakes), he doesn't learn and develop skills from his own experience.

Computer-aided Drawing

Computer-aided drawing on microcomputers existed only in crude form prior to the Macintosh. The Macintosh's bit-mapped, high resolution screen, visual interface, and mouse, along with various drawing programs like MacPaint and MacDraw have made computer-aided drawing accessible and easy.



Rubber band powered airplane drawing, done with MacDraw by Jon Zeitler.

Programs like MacPaint and MacDraw put the same type of electronic editing power found in writing programs into drawing programs. As with computer-aided writing, drawing with either of these programs separates the composition process from the printing process, making a new type of graphic editing possible. Many people who are intimidated by drawing with pencil and paper find drawing approachable and enjoyable with MacPaint and/or MacDraw. These computer-aided drawing programs eliminate many of the roadblocks found in traditional visual expression: re-drawing an entire piece because of a mistake, alignment and re-alignment of drawn objects on a page, making changes after the fact, drawing straight lines, drawing circles and squares, and more. The programs are also significant learning environments in that their use encourages trial and error learning. As with computer-aided writing, printing an image made with a computer-aided drawing program is easy, and if a problem is seen in the print, the original file can be edited and another print can be made easily.

Drawing Is an Important Skill

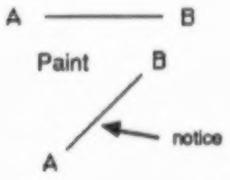
> "For the dyslexic/dysgraphic person who is having a hard time with writing, drawing can become a significant part of his personal expression."

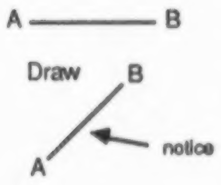
Drawing is an important skill that many of us have never developed. It not only gives perspective to our writing but it can be used as an analytical tool to see ideas in different ways than are possible with verbal expression alone. Writing lacks a visual/spatial aspect and as such cannot always express our ideas. Many times we push our writing too far because we feel that drawing isn't a viable alternative. For the dyslexic/dysgraphic person who is having a hard time with writing, drawing can become a significant part of his personal expression. Unfortunately, many of us have rigid models of what good drawing is and what it should be used for. We're too quick to link drawing to fine art. When we let go of the fine art association and look at drawing as a tool for personal expression and problem solving, it can become as important a part of our process of information exchange as reading and writing are.

MacPaint and MacDraw

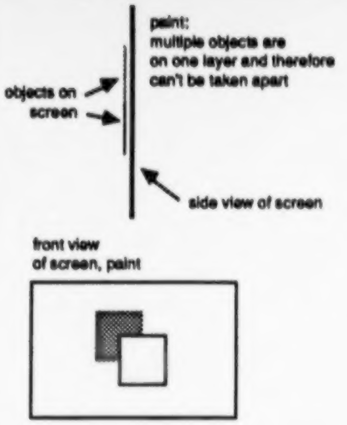
When many people think of drawing with the Macintosh they immediately think of MacPaint. MacPaint was the first drawing program released for the Macintosh and it is still very widely used. There are now other "paint" programs like FullPaint and SuperPaint that take what MacPaint does further, but they are all still paint programs (SuperPaint is actually a paint and draw program combined). MacDraw and other, *object-oriented* drawing programs differ from paint programs in some very important ways, some of which are of particular value to the dyslexic/dysgraphic person. Below is a closer look at the differences between paint and draw programs.

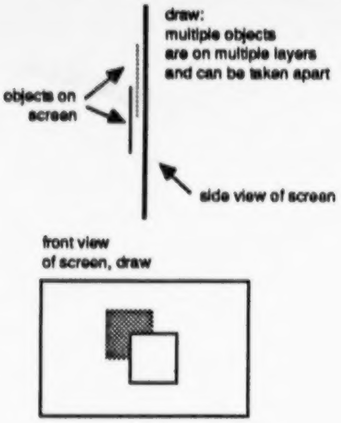
Both paint and draw programs represent objects on the *screen* as dots and lines. The difference lies in how the two programs *store* information about what's on the screen. Paint programs store an exact *bit-map* of where the dots and lines are on the screen. Draw programs store coordinates and shapes rather than exact bit-maps. If a screen is 512 dots (pixels) across by 342 dots (pixels) tall, then any point on the screen has an exact coordinate. Paint programs store information about a line going horizontally from point A to point B as a series of all the points (pixels) in between. Draw programs store information about where point A is and where point B is and the fact that there is a line of a certain thickness connecting them, rather than storing each dot in between.





"Objects are stacked on different planes, with earlier-drawn objects underneath."


paint:
multiple objects are
on one layer and therefore
can't be taken apart
objects on
screen
side view of screen
front view
of screen, paint


draw:
multiple objects
are on multiple layers
and can be taken apart
objects on
screen
side view of screen
front view
of screen, draw

What do these and other differences mean to the person (dyslexic or not) using the two types of programs? Here is a comparison of a few of the important differences.

Altering, Re-shaping and Separating Objects

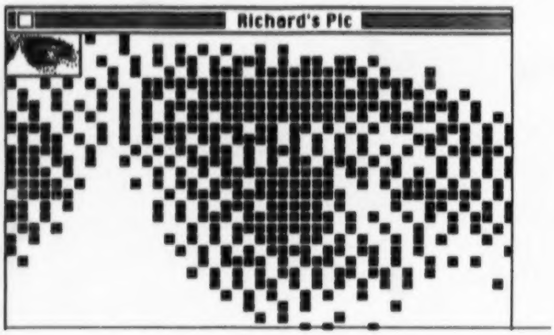
MacPaint has an eraser that allows "sculpting" drawn shapes.
MacDraw doesn't allow the easy "sculpting" of objects.

With MacPaint (like with a pencil or using any drawing tool on paper), once something is drawn and something else is drawn over it, they are inseparable. They are on the same plane and are blended.
With MacDraw, any object is separable from any other object at any time. Objects are stacked on different planes, with earlier-drawn objects underneath. The stack of objects (their relative "height" in the stack) can be changed easily and at any time. One can send an object to the back (bottom) of the stack or pull an object to the front (top) of the stack.

Pixel or Dot Editing

This is where MacPaint shines. MacPaint allows the editing and manipulation of individual dots or pixels on the screen (see below).
Because MacDraw stores information about shapes/objects as coordinates instead of bit-maps of dots, it doesn't allow dot or pixel editing.

A digitized image can be edited on a dot (pixel) level in MacPaint, not in MacDraw.


Richard's Pic

Aligning Objects

MacPaint has no facility for this because it doesn't treat shapes as objects but rather as arrays of dots.
MacDraw has a number of useful tools to help in aligning objects.

Grouping and Ungrouping Objects

MacPaint allows the building up of a drawing and its modular inclusion in other drawings. It doesn't have a facility for taking built-up drawings apart.
MacDraw has a tool for taking different objects and grouping them into one object, then, at any later time, un-grouping the object and manipulating the original separate pieces.

Text Editing

For the dyslexic person, this may be the single most important difference between these two types of programs.
MacPaint treats text as a bit-mapped drawing. This means that once text is typed and the cursor moved to another spot on the screen, the text isn't treated as text anymore and isn't editable.
MacDraw always treats text as text and allows full text editing during and after the fact.

There are many other significant differences between these two programs and to fully comprehend them you really have to use both side by side. MacPaint is a much simpler and in some ways, more intuitive program. MacDraw is more powerful than MacPaint but the price you pay for power is a longer learning curve.

Using MacPaint and MacDraw with Switcher

In our Macintosh Lab we want our students to have access to the capabilities of both types of drawing programs so that they can decide for themselves when it is appropriate to use each. We set up student disks with MacDraw, MacPaint and Switcher, a program distributed by Apple that allows a Macintosh with at least 512K of memory to run multiple programs in memory partitions (see Note on Switcher at the end of this article).

We give our students a number of projects to work on that not only introduce them to the power and particular capabilities of MacPaint and MacDraw but are exercises that help strengthen their abilities to think visually.

Map Making

Using MacDraw we have students make maps of the Forman campus. MacDraw allows the easy editing and scaling of maps and the addition of text to describe roads and buildings. We've found this exercise particularly helpful for students who have weak visual memory and directionality skills.

Flow Charts

Using MacDraw, we have students make simple logic diagrams. They can easily edit and re-work the logic as they see problems with it. This is in addition to work with linear outlining with Acta.

Modularity

Using MacDraw, we introduce students to the concept of modularity and the idea of using parts to build larger parts. This concept is extremely powerful across many different areas, from drawing and design to programming.

Paper Airplanes

Using MacDraw, we have students make templates of the folds required to make a paper airplane of their own design. On a single sheet of paper they must have all of the fold lines, a drawing of the finished folded plane, and a written description of folding the plane. The written description and the drawing of the folded plane must stay visible as the plane is being folded. This is the most complex project given in the Lab and students love it. It teaches them very quickly how to use MacDraw and also about airfoils, order-of-operations considerations and the importance of clarity of instructions.

Digital Photography

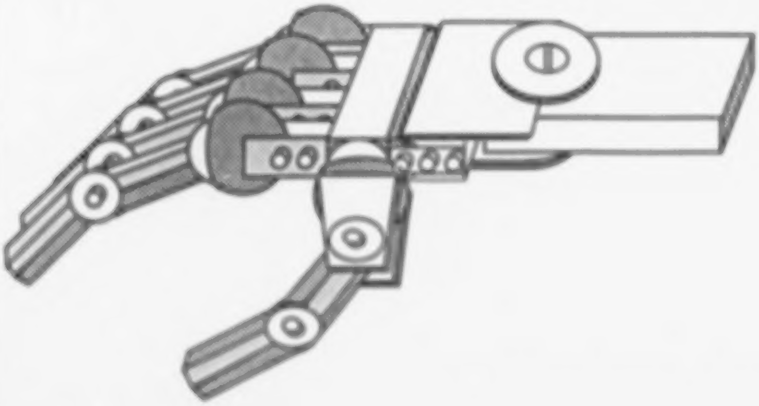
Using the MacVision video digitizer and a video camera, we have students make pictures of themselves, editing (playing with) the pictures with MacPaint and using them in their other work.

One Person's Experiences with MacDraw

Jon Zeitler is the student I described at the beginning of this article. He is one of our most advanced students and has been using MacDraw for a year now. Interestingly—given his early experience with drawing and his reluctance to try MacDraw—it has become an integral part of Jon's thinking and work process. Jon is dyslexic and dysgraphic, and his handwriting as well as his hand-drawing is hard to decipher, even for him. With MacDraw, Jon has been able to separate the limitations of tools (pencil and paper) from what he thought were his own limitations. Now he readily sits down to use MacDraw for everything from map making to circuit design. He has even customized his copy of MacDraw, adding command keys to various commands he uses a lot and changing existing command keys so that they are mnemonic and easier for him to remember.

Included here are a few of Jon's drawings done this year (the airplane on page 3 and the robot hand on this page). Each drawing consists of hundreds of objects that have been manipulated, aligned and grouped. The drawings have been scaled down for this newsletter.

Jon's use of MacDraw (and many other Macintosh programs) is a particularly explicit example of what an accessible computer with good software tools can do for a dyslexic person. It is also an example of the importance of looking at drawing as a tool for personal expression and problem solving rather than simply as a fine art.



Robot hand drawing done with MacDraw by Jon Zeitler.

Note on Switcher

Switcher or, as sold by Apple, Switcher Construction Set, is an application that is used to partition the memory of a Macintosh so that multiple programs can be accessed more easily. Normally, you run a program from the Finder and when another program is needed, you quit from the program running, return to the Finder and run the other program. If you are doing a lot of cutting and pasting between documents of different programs this type of movement can become burdensome, especially on a Macintosh with only floppy disk drives (hard disks speed up movement between programs—even through the Finder—significantly).

One way to think about what Switcher does is to imagine having two Macintoshes side by side, one running MacWrite and the other running MacPaint. Imagine some magic facility that allowed you to cut a MacPaint image onto the Clipboard of the Macintosh it is running on and paste it from the MacWrite Clipboard on the other Macintosh into your piece of writing, without quitting either program or doing anything fancy. This is essentially what Switcher does except that it does it with one Macintosh. The minimum memory requirement to run Switcher is 512K. The more memory you have above 512K, the more room you can give the partitions that will hold the programs, or the more programs you can run simultaneously. You can run up to eight programs at the same time, given enough memory.

Setting up Switcher Sets

In my experience, a prerequisite to using Switcher is a basic understanding of the concept of a computer's memory. Without having a handle on this, Switcher works by magic.

Configuring Switcher to make partitions and load certain programs doesn't take much time but once done it would be nice if you could save that particular configuration and run it directly. In fact you can do this by saving the configuration as a Switcher Set. A Switcher Set is nothing more than a small command file that tells Switcher how to partition the memory of your Macintosh and which programs to run in the partitions. You can have any number of different Switcher Sets depending on which programs you want to run together.

In our Lab, since we use MacWrite, MacPaint and MacDraw a lot (sometimes on 512K Macs so we can only run two of them at once) we have three Switcher Sets which students can use depending on which programs they want to move between: Write/Paint, Write/Draw and Draw/Paint. With a Macintosh Plus which has 1024K of memory, we can run all three together at the same time (as we do in one of our Lab bays with Macintosh Pluses).

Switcher Construction Set is very inexpensive ($19.95) and comes with excellent documentation. Also, most Macintosh users groups can help you learn how to use Switcher.

Acta, Version 2.0

Tim Shaw

"Let all things be done decently and in order."
-I Corinthians

Acta 2.0 has been released by Symmetry Corp., with some significant advantages over previous versions. Included in this version are the ability to open multiple windows/outlines simultaneously, the ability to access and save as different formats, and some new outlining, typestyle, and printing options.

Up to Four Windows Open at a Time

Now you can have four windows open simultaneously, in any combination of new or already saved files. For me, this is the most immediately helpful new characteristic. Now I can work on several outlines at once or merge two or more outlines easily, either to make one big outline or for something as simple as printing more than one outline on one page. Holding the command key and hitting the "1," "2," "3" or "4" key brings the appropriate window forward. New windows are numbered until you Save as... and rename them.

Format Drivers Allow Access to non-Acta Documents

Imagine wanting access to a More or ThinkTank document while working in Acta, or wanting something from the Scrapbook in your outline. A set of Format Drivers shipped with Version 2.0, when placed into your System Folder, enable Acta both to Save as... and to Open... formats different from its own.

New Options Add the Finishing Touch

Typestyle options now include support for color printers, enabling you to print different families or topics in various colors. Another printing option is Include Header, which prints a top line with your outline title, followed by a parenthetical note telling the last date saved, and the page number (flush right).

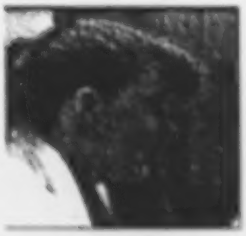
User-Friendly Is Still the Name of the Game

The nicest thing about Acta updates is that, no matter how versatile the program becomes, it has lost none of its user-friendliness; it is still as easy and intuitive to use as its first release. Our students can use Acta 2.0 this September without having to "unlearn" anything about Acta 1.2—both a relief and a pleasure for them and us.

Recent Developments

Richard Wanderman

Photo Session and Interview



Apple's Creative Services(advertising, etc.) Department, is putting together two booklets on what teachers are doing with Apple's computers (one on the Macintosh and one on theApple IIgs). Out of over 200 schools which are doing interesting things with Macintosh computers, we were among the five schools to make it into the booklet. Apple sent two professional photographers, an art director, and a writer out to Forman to take pictures and interview us. The subjects of the interview and photo shoot were Jon Zeitler and Annette Jenner (two recent Forman graduates) and me. We're looking forward to seeing the finished booklets sometime in the next two months.

Cupertino

While on the West Coast I had occasion to spend some time at Apple's headquarters in Cupertino, California. Not only did I get to meet many of the people who I've been on the phone with all year, but I got a tour of one of the most successful computer companies in the country. It was most enjoyable. In talking with Robin Coles who helps run Apple's Office of Special Education I found out that their main focus is on physical disabilities and they have been referring questions about learning disabilities to me. No wonder my phone has been ringing off the hook! But, this is wonderful for us at Forman in that we are becoming known as a respected source of information about the Macintosh and dyslexia.

Claris

Apple has decided to form a new, spinoff company called Claris to market Apple label software. Claris will take over marketing of all Apple label Macintosh software except what Apple deems "system software." System software includes the Finder, all system-related files and utilities, and HyperCard (see below for more on HyperCard). It will be interesting to follow Claris and see what type of impact this new company has on the Macintosh software market.

Educator Buy Program

Apple has re-instituted their Educator Buy Program. The program allows teachers, administrators and certain qualified staff of educational institutions to purchase select Macintosh and Apple II products at a substantial savings. The two Macintosh systems on the Educator Buy are: Macintosh Plus, $1429. and Macintosh SE with built-in hard disk 20SC and Apple keyboard, $2410. You can also buy an ImageWriter II for $417. You have to add local state sales tax (where applicable) and shipping to these prices but they are still excellent prices. Many Forman teachers have bought Macintoshes on this program.

512K Macintosh Discontinued

The 512K Macintosh has been discontinued by Apple. It seems amazing, since not too long ago 512K was a lot of memory. We've come a long way, very quickly. This doesn't mean that people with 512K Macintoshes are outcasts (we still have many of them in our Lab and around our school) but it does mark a move toward more memory to accommodate more sophisticated software. Institutions buying directly from Apple may still be able to buy this machine (for a while) since it's on their July educational price list.

Boston Macworld Exposition

Richard Wanderman

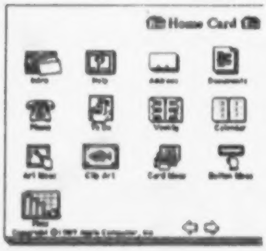
In the Macintosh world there is a semi-annual event which brings Macintosh users and enthusiasts together from all over the world. This event, the Macworld Exposition, takes place in January in San Francisco and in August in Boston. This past August, Jon Zeitler, Judy Kistler (a Forman mathematics teacher and Macintosh enthusiast) and I traveled to Boston to "experience" the Expo. which was full of new and wonderful hardware and software for the Macintosh. Below is a brief discussion of some of the more noteworthy discoveries at the Expo.

HyperCard

When Apple introduced the Macintosh in 1984 it was a momentous occasion. There was wonder and excitement in the air. I've been following the Macintosh world ever since and at only one time since the Macintosh was introduced have I felt that same wonder. It was a few weeks ago up in Boston at the Macworld Expo watching Bill Atkinson demonstrate the product that he's been locked up at Apple with for the past three years. He called this his "dream product." Bill Atkinson is responsible for much of the way the Macintosh works as he wrote the important underlying code in the Macintosh's ROM that controls the way the machine deals with screen graphics (a set of routines called Quickdraw). He also wrote MacPaint to show off the Macintosh's graphics capabilities. Atkinson is an Apple Fellow, a person who is so talented and so valuable to the company that they give him the freedom to dream and create what he wants. HyperCard is what he's come up with. He has created something truly fantastic and he took tremendous pride in showing it off. I was very much moved by the experience of seeing and hearing him show off his newest creation.

> "Atkinson is an Apple Fellow, a person who is so talented and so valuable to the company that they give him the freedom to dream and create what he wants. HyperCard is what he's come up with."

HyperCard is one of the most significant new developments in the software world since it is an *associative* way of storing and retrieving information. It uses a "card" and "stack of cards" metaphor with buttons (that you click on with the mouse pointer) for moving around in stacks and between stacks. Associative is the key word. Imagine this: you have a file (or stack) of names and addresses of your students. You have another stack of those same students' academic records and another of their test scores. HyperCard allows you to link individual student records together in such a way so that when you want to move directly to a particular piece of information on a particular student you can do it immediately. In the HyperCard world, a file is called a "stack" and you'll be hearing a lot about "stackware" in the future. Multiple stacks can be linked together extremely easily with HyperCard's most versatile tool: the button. HyperCard is the essence of "point and click" technology. You can design and place buttons anywhere you like in your "interface" and you can make the cards and buttons in a stack look any way you like since Atkinson has built in an extremely powerful superset of his MacPaint program. HyperCard facilitates an extremely graphical way of manipulating information, and if you've used the Macintosh for any length of time you probably realize how powerful (useful) a graphical interface is.



It is Atkinson's intention that HyperCard will open up software (stackware) development to many more people than are now developing products for the Macintosh market. Making a Macintosh application like MacWrite takes a tremendous amount of time as the Macintosh is not an easy machine to program. HyperCard makes the development of working stackware relatively easy and uses a metaphor that makes the visualization process (defining what you want to do) much easier than ever before. Atkinson called HyperCard a "software erector set" because it allows users to build with already working modules.

> "Atkinson called HyperCard a 'software erector set'"...

HyperCard comes with a variety of working stacks that you can use right away to store information, dial a phone and more. There will be commercial stacks available for purchase if you need more than what comes with the program and/or decide not to make your own.

HyperCard and Dyslexia

What does this product mean to the dyslexic/dysgraphic person? A tremendous amount! If you understand what the visual interface of the Macintosh does for people with language disabilities then you'll appreciate what this type of environment can do for them. Buttons don't have to look like buttons with text on them, they can be icons eliminating the language barrier to navigating a HyperCard application. Moving laterally and spatially through ideas searching for things is much easier to deal with than an abstract hierarchical structure. Atkinson thinks of this program as coming closer to the way we do things in our heads and this makes manipulation of the program seem extremely natural. We'll have more on this in future issues of *The Monitor*.

HyperCard comes free with all new Macintoshes. Or, you can purchase HyperCard for $49. from an Apple dealer. HyperCard comes on four disks and includes: to do lists, calendars, filing cabinets, address books, a phone dialer, area code listings, time zone listings, idea stacks with hundreds of ideas for stacks, cards, and buttons, a very complete on-line help stack system that really works in that you can get to it at any time thanks to the wonderful way HyperCard works, and an excellent printed manual.

HyperCard will run on any Macintosh with at least 1024K of memory (standard on Macintosh Plus, SE or II) and at least two 800K disk drives. A hard disk is recommended. HyperCard also works with Apple's file server, AppleShare.

HyperCard is the most significant piece of software I've ever seen, on any computer, ever. It is truly amazing and extremely exciting. I urge you to check it out.

Thank you, Bill Atkinson.

Multi-Finder

This is Apple's answer to Andy Herzfeld's Servant program (for those of you who follow these things). This is a very significant product from Apple. It offers a significant enhancement in the operating system of the Macintosh that changes the fundamental way one runs and uses programs. Instead of running one program at a time from the Finder, MultiFinder allows you to run many programs on top of one another (in their respective windows); just click on the window containing the program you want to work with to bring it to the top and into use. Imagine that you're at the Finder and want to run MacWrite. You double click on MacWrite and it opens in a window on top of the Finder. You can get back to the Finder by simply clicking on its window, bringing it to the top. The number of programs you can run this way is determined by the amount of memory your Macintosh has (minimum memory requirement for MultiFinder is 1024K, standard on Macintosh Plus, SE or II). (For another way of doing something similar, see Note on Switcher elsewhere in this issue.) The difference between MultiFinder and Switcher is that MultiFinder lets programs that are written to take advantage of it perform certain tasks in the background. For example while you are printing a complex drawing from (an upcoming version of) MacDraw and the LaserWriter is grinding away, you can bring MacWrite to the top and do some writing. This is significant!

New Writing Programs

There is a variety of new writing software for the Macintosh. Microsoft updated their Word 3.0 program to make it run faster; Ann Arbor is about to release FullWrite Professional; the MS-DOS program Word Perfect has been re-written for the Macintosh, and there are undoubtedly other new writing programs. As far as I can tell, all of these programs offer many new features that programs like MacWrite and WriteNow lack, but those features aren't important to the dyslexic person (or any person) who just wants to get some simple writing done. The new writing programs are also very expensive relative to MacWrite and WriteNow, which can each be bought for around $100. Certainly, if your word processing needs are complex, then you should be looking at these new programs. All of us at Forman, students and faculty alike, use MacWrite or WriteNow and are perfectly happy. If we want to do desktop publishing, we use PageMaker and don't expect a writing program to handle those types of needs. (This newsletter is written with MacWrite and WriteNow and assembled with PageMaker.)

Lookup

Working Software, Inc. (formerly Green and Johnson, Inc.), the makers of Spellswell, have a new desk accessory called Lookup. Lookup is an on-line (desk accessory) spelling *finder* that accepts wildcard characters if you aren't sure about the spelling of a word in question (typing "vi?w" will find any word starting with "vi" and ending with "w," including "view"). We have been sent a review copy of the program by the company and will have a review in an upcoming issue of *The Monitor*. So far we're quite impressed.

Hard Disks and Memory Upgrades

There were numerous hard disk vendors at this Macworld Expo selling inexpensive internal and external 20 megabyte, 40 megabyte, 80 megabyte and even larger capacity SCSI (small computer systems interface) hard disks. Apple made a wise choice by adopting the SCSI interface for hooking up to hard disks and other peripheral devices to the Macintosh Plus and newer Macintosh computers. The SCSI interface is an industry standard and it allows more hard disk companies to get into the Macintosh market, forcing the price of hard disks down.

There were also many companies selling SIMMs (single in-line memory modules, a way of mounting RAM chips) for the Macintosh Plus, SE and II. The price of RAM has come down considerably, but now there is a need for faster and denser RAM, since having so much memory in a computer can make things get hot if there are a lot of chips with smaller amounts of memory. New Macintosh Pluses and SEs come with four banks of 256K chips in them. When you upgrade to larger amounts of memory you don't get more 256K chips but replace them with one megabit chips (four times the density). So, RAM is still relatively expensive ($600. - $1000. to upgrade a Macintosh Plus, SE or II from one megabyte of memory to two and a half megabytes). Why the need for so much memory? There is now software coming out—like HyperCard and MultiFinder—that requires at least one megabyte (1024K) to run and there will undoubtedly be other software in the future that requires more. For the average person using his/her Macintosh 512K enhanced or Macintosh Plus for everyday writing and drawing tasks, this isn't too meaningful. At this point, in my mind, the big reason to have at least 1024K of memory is to be able to run HyperCard. This software is worth buying some memory for.

ImageWriter LQ

Apple has come out with a new high-end ImageWriter dot-matrix printer that looks very good (LQ = letter quality). It is a larger printer than the ImageWriter II and is capable of more sophisticated tasks. Its sophistication is in the density of its print (up to 240 dots per inch, very close to the LaserWriter which prints at 300 dpi) and in its paper handling capabilities. This printer can handle up to three types of paper at once. You can have letterhead in one feeder, envelopes in another, and labels in another. The tractor that handles form-feed paper can now pull that paper through the platen rather than push it, the source of countless jams on the ImageWriter II. The ImageWriter LQ is considerably faster than the ImageWriter II and has a wide carriage for printing wide spreadsheets and other oversized documents. It also takes the same AppleTalk card that the ImageWriter II takes so that it can be connected to an AppleTalk network. We were very impressed with this product, which should cost around $1400.

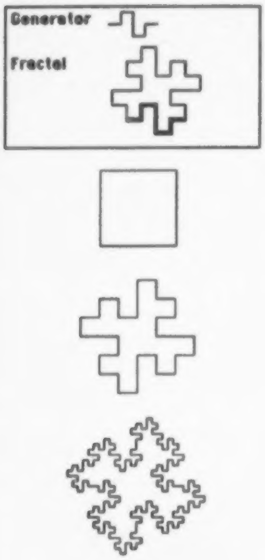
LCD Plate/Overhead Projector

For a classroom using Macintoshes, the "Macnifier" was one of the best new products at the show. Taking a video image out of the Macintosh is complicated by the fact that the Macintosh does not send out a standard video signal. This means that Macintosh users can't buy generic video projectors and external large-screen monitors. There are a number of specialized projectors and monitors available for the Macintosh like the Limelight video projector and the Conrac large-screen monitor, but the cost of these devices is too high for many school budgets. Imagine this: You have a way to take a video signal off the Macintosh and run that signal to a flat (2-inch thick), see-through panel about the size of the Macintosh screen that displays it. You place the panel on top of a standard overhead projector and, when projected, you have an image of the Macintosh screen large enough for many people to see. This product is available now for $1500. (see Products Mentioned), and we are thinking of purchasing one for our Lab and for our conference presentations.

Personalities

Many of the important developers in the Macintosh world were on the floor of the Macworld Expo. We met David Dunham, the author of Acta, miniWriter, Findswell and a variety of other commercial and shareware applications. We were introduced to Andy Herzfeld who, along with Bill Atkinson (see HyperCard above), was responsible for much of the underlying software that makes the Macintosh work. Andy is a delightful person in that he's definitely a "heavy" (he wrote the Macintosh toolbox routines, Switcher, Servant, Thunderscan software, the software used by Radius in their large screen and accelerator boards, and more), but comes off as a regular guy and will stand around talking with us mere mortals. After Bill Atkinson demonstrated HyperCard we actually squeezed up and spent some time talking with him. We saw John Draper, the notorious Cap'n Crunch (and an "interesting" looking character), on the floor and talked with him about old times. Many years back he developed a "blue box" that could generate the tones that the phone company uses and with it a person could make calls without being charged. Coincidentally, the two founders of Apple, Steve Wozniak and Steve Jobs, were in the blue box business when they were trying to earn money to build "other" things.

Dick Koch



Dr. Richard Koch
Dept. of Mathematics
University of Oregon
Eugene, Oregon 97403

The most impressive personality we met at the Expo was an old friend of mine from the University of Oregon who the Forman contingent stayed with while in Boston, Dr. Richard Koch. Koch is a Professor of mathematics, musician, scholar, and wizard Macintosh programmer who is so humble as not to be believed. Koch wrote the public domain software miniDOS (which allows Finder-like functions to take place within applications), Fractal (a wonderful fractal generator that is as much an instructional tool as it is a graphical masterpiece), Mandelbrot (another Fractal generator which is so impressive that Apple flew Dick to Europe to demonstrate it at the International Apple University Consortium Conference in Cambridge) and more recently, many of the software patches that E-Machines uses with their big screen which facilitate its use with the Macintosh. We talked with Koch about everything from programming the Macintosh (he stayed up most of one night with Jon Zeltler teaching Jon about Lightspeed Pascal and trigonometry) to building harpsicords (Koch builds his own and plays Bach on them, of course). Koch was in Boston working on a 3D geometry program for high school students along with Boston University mathematician, Alan Hoffer. This program is extremely impressive and will be available commercially in the future.

If you are interested in any of Dr. Koch's public domain programs (you don't have to be a mathematician to enjoy Fractal or the other mathematics programs he's written) you can write him at the University of Oregon.

I recommend sending him (in addition to a note telling him what you would like) a blank, initialized, double-sided disk, an envelope with your name and address on it, and return postage, as he gets numerous requests for his work.

From the Rest of Us...

Laurie Fais

The Eighties is the decade of wonder women. This is the time when the career-minded among us have our babies and heroically/stupidly go back to work the following week. I went back to work the week after having a baby when the most technologically advanced item in my office was a clattering electric typewriter. I still remember nursing her as I typed and having her kicking and squirming right along with it.

Now there is a Macintosh on my desk. It is infinitely quieter, so baby #2 nuzzles or snoozes happily on my lap while I drag information around. Besides, she also likes the "ding" of the Macintosh when I turn it on. But there are other advantages, as well. Trying to nurse or comfort an infant and work at the same time requires quite a bit of one-handed execution of both tasks. Dealing with a baby with one hand is an ancient maternal art. But dealing with a computer with one hand is enhanced or complicated by the nature of the computer. The Macintosh is particularly well-suited to the situation.

Editing something already written is probably the easiest thing to do one-handed. Much of the manipulation of text can be done with the mouse, an essentially one-handed operation, and very easy once you remember (if you are a right-hander) to move the mouse to the other side of the keyboard if your right hand is busy and you are working with your left. But what struck me recently was how easy it is to use command key sequences one-handed for editing and other mouse-intensive chores. The letters for various keyboard commands are all grouped within close one-handed reach of the command key—just hold that down with your pinkie and you can Quit (Q), Undo Typing (Z, very useful when the baby reaches the age where (s)he is grabbing at the keyboard), Cut (X), Copy (C), Paste (V; why "V"? well, obviously, it's *designed* so that mothers can nurse and edit at the same time), Find Next (F), and Goto Page # (G). Getting italics this way is a little harder and getting plain text requires the finger span of a piano player, but boldface is not so hard, and babies *do* lie down in the portable crib you keep in your office and sleep sometimes!

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Products Mentioned

Retail prices are in parentheses. Products can sometimes be purchased through mail-order houses for less.

Macintosh SE HD20 ($3569.), **Macintosh Plus** ($2199.), **LaserWriter** ($4995.), **MacWrite** ($125.), **MacPaint** ($125.), **MacDraw** ($195.), **Switcher Construction Set** ($19.95), **Font/DA Mover** (free with purchase of a Macintosh), **HyperCard** (comes with all new Macintoshes or $49.), **AppleShare** ($799.), Apple Computer, Inc. 20525 Mariani Ave., Cupertino, California 95014. 408/996-1010.
FullPaint ($99.95), Ann Arbor Softworks, 2393 Teller Rd.,Suite 106, Newbury Park, California 91320. 805/375-1467.
SuperPaint ($99.), Silicon Beach Software, 9580 Black Mountain Rd., P.O. Box 261430, San Diego, California 92126. 619/695-6956.
Acta ($59.95), Symmetry Corporation, 761 East University Dr., Mesa, Arizona 85203. 602/844-2199.
ThinkTank ($195.), **More** ($295.), Living Videotext, 117 Easy St., Mountain View, California 94043.
Spellswell ($74.95), **Lookup** ($ 49.95), Working Software, Inc., 321 Alvarado, Monterey, California 93940. 408/375-2828.
Word 3.0 ($395.), Microsoft, 16011 NE 36th Way, Redmond, Washington 98073.
WriteNow ($175.), T/Maker Co., 1973 Landings Dr., Mountain View, California 94043.
PageMaker ($495.), Aldus, 411 First Ave. South, Seattle, Washington 98104.
MacVision ($349.95), Koala, 269 Mt. Hermon Rd., Scotts Valley, California 95066.
Macnifier ($1500.), Comtrex Ltd., P.O. Box 5500, Newport Beach, California 92662. 714/855-6600.

Contributors

Richard Wanderman has an MFA in Fine and Applied Arts from the University of Oregon, Eugene. He has taught ceramics, design and computer-aided design at the University of Oregon. He has also written, lectured and done workshops about the connection between personal computers and dyslexia. He is currently directing the Computer-aided Writing Project at The Forman School.

Tim Shaw received a BA in English and Classics from St. John Fisher College in Rochester, New York, and an MA in Medieval Studies from The University of Connecticut. As a Graduate Student Teacher at UConn, he received the 1984 Award for Academic Excellence. He has taught English Literature at Forman since May, 1984. He currently teaches Composition on the Macintosh at Forman.

Dr. Laurie Fais received her PhD in Linguistics from Indiana University in 1981. In 1982, Dr. Fais came to The Forman School to teach Language Training and act as Director of Professional Development. She is currently the Head of the Language Training Department and is involved with the Forman Computer-aided Writing Project. Dr. Fais helped to write the Language Training Department curriculum and has presented papers on teaching linguistics to dyslexic adolescents and on the LT curriculum.

Glossary

A list of computer-oriented and education-oriented terms which have been used in this or past issues.

Dyslexia A neurological difference that causes difficulty with reading and writing. Dyslexia is a developmental disability; it can be affected by environmental factors.

Dysgraphia A neurological difference that causes difficulty with handwriting and other types of symbol making. Usually associated with dyslexia.

Multi-sensory Processing information through more than one sense or presenting information to more than one sense. Multi-sensory feedback is a feedback system where many senses are involved.

Process Approach to Writing Focus on and use of the entire writing process, rather than the resulting product, usually starting with unstructured writing and later moving toward structure, mechanics, and spelling correction.

MacWrite A Macintosh writing (word processing) program.

Acta A Macintosh outlining program.

MacPaint A "paint" or bit-mapped Macintosh drawing program that enables you to manipulate and edit drawn shapes on the dot or pixel level.

MacDraw A "draw" or object-oriented Macintosh drawing program that stores information about objects drawn on the screen in terms of coordinates rather than exact bit-maps.

SuperPaint A Macintosh drawing and drafting program that combines paint and draw characteristics.

Pixel A contraction of "picture element." All video (cathode ray tubes, CRTs) are made up of dots. Each dot is a picture element or pixel. The Macintosh video screen is made up of 512 pixels across by 342 pixels vertically (or 17,5104 pixels).

Bit-map Literally, a map of the bits or pixels on the screen. If a Macintosh screen is 512 pixels or bits across and 342 bits or pixels tall, then any single pixel on the screen has a set of coordinates. Part of the computer's memory is dedicated to mapping where there are pixels turned on and where they are turned off.

Object-oriented A software environment that is based on objects that have manipulable attributes.

Finder A Macintosh system program that manages files and directories of files. The Finder is a visual shell for the Macintosh operating system. When you put a startup disk in the Macintosh, the program that automatically starts up is the Finder.

System The System file on a Macintosh disk contains the operating system of the computer. It also contains resources that all programs on that disk share. Some of these are fonts and desk accessories.

Hard Disk A high-speed, high-capacitv, fixed disk. A hard disk might hold 20 megabytes (billion bytes) or more.

Desk Accessory Small programs that are accessible while a larger program is running. A DA allows the user to access two programs at once.

Memory A component of a computer that holds information for the microprocessor to work on, some permanently, some temporarily. Memory is usually made up of arrays of chips. Strictly speaking, disk storage is memory; most people do not include disk storage when talking about computer memory.

RAM Random Access Memory. A RAM is a type of memory chip. The Macintosh has either 128K, 512K, 1024K or more RAM in it. There are banks of RAM chips soldered to the main circuit board inside the machine. RAM holds programs (MacWrite) and data (your writing) so that the microprocessor can work with them. It's volatile, which means that it only works when it has power (electricity). Take away power and the information in RAM chips disappears.

ROM Read Only Memory. A type of RAM chip that holds essential information and cannot be used by you to store new information. Parts of the operating system of the Macintosh are stored on its ROM chips. The Macintosh has 64K, 128K, or if you have an SE or II, 256K of ROM. ROM is sometimes called Firmware because it's not quite hardware and not quite software, but a combination of both.

Network Sometimes called "local area network" or LAN. A group of small computers linked together so that they can share printers and other devices.

AppleTalk A LAN that connects Macintoshes to each other and to shared peripheral devices, such as printers.

File server A set-up (hardware and software) that allows several computer users working on computers configured in a local area network to have access to the same files.

AppleShare A file server produced by Apple Computer, Inc. AppleShare is software which can run on hard disks produced by Apple or other manufacturers.

Macworld A semi-annual event sponsored by Macworld magazine and Apple Computer, Inc.

AppleWorld An annual conference sponsored by Apple Computer, Inc.

MS-DOS Microsoft Disk Operating System. The file system of the IBM PC family of computers and its clones. A command-line driven file system.

Switcher A utility program for partitioning the memory of a Macintosh to enable the running of more than one program simultaneously.

SCSI Small Computer System Interface. An industry standard port or interface. A port or interface is a physical place on the computer's main circuit board that allows information to be sent in or out of the computer. The ImageWriter printer plugs into the Macintoshes printer port. Only the Macintosh Plus, SE and II have a SCSI port (although it can be added to 512K Macintoshes by companies other than Apple).

SIMM Single In-line Memory Module. A way of holding RAM chips on the main circuit board (motherboard) of a computer. A small circuit board that has RAM chips mounted on it. Macintosh Pluses, SEs and IIs use this type of memory.

LCD Liquid Crystal Display. A way of displaying information on a screen. The same type of display found on many digital watches.

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